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AT5	Transmitters, as new, with valves & dust covers, £8/17/6	
AT5/AR8	Aerial Coupling Units, as new	£2
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BC611 (SCR536)	Walkie-Talkie, American, complete with valves	£25 a pair
3BZ	Transmitter, complete with valves, 12v. operation	£15

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Two-gang	Split-Stator Condenser, 8 to 25 pF. per sect.	30/-
Four-Gang	Condensers, approx. 150 pF. per section	£1
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No. 11 Genemotors, High Power 17/6

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WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Broadcasts.

VK3WI: Sundays, 1100 hours EST, 7146 Kc.; 1800 hours EST, 144 Mc. No frequency checks available from VK3WI. Intra-state working frequency, 7050 Kc.

VK3WI: Sundays, 1130 hours EST, simultaneously on 3573 and 7146 Kc., 57.5 and 146.25 Mc. Intra-state working frequency 7135 Kc. Individual frequency checks of Amateur Stations given when VK3WI is on the air.

VK1WI: Sundays, 0900 hours EST, simultaneously on 7146 Kc., 14342 Mc. and 26.172 Mc. Country hook-up Sunday mornings 0900 hours. Please call VK-42MX on 20 mx and Bruce VK4ZBD on 6 mhz.

VK3WI: Sundays, 1000 hours EAST, on 7146 Kc. Frequency checks are given by VK3MID and VK3WI by arrangements on all bands to 86 Mc.

VK6WI: Sundays, 0930 hours WAST, on 7146 Kc. No frequency checks available.

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VK3WI: Sundays, 1000 hours EST, simultaneously on 3.5, 7, 14 and 144 Mc. bands. Individual frequency checks of Amateur Stations given when VK3WI is on the air.

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EDITORIAL



WHERE ARE AUSTRALIAN AMATEURS HEADING?

Eight years ago a forceful statement of endorsement of the U.S. Amateur Radio Service by the American Communications Policy Board set up by President Truman to make a study of U.S. frequency usage and communications policy, was released in a subsequent report to the American people.

Today the United States Amateurs are told by their Telecommunications Board—the present official title of the original President's Communications Policy Board established by the Office of Defence Mobilisation—in a re-appraisal of the country's telecommunications policy that, and we quote:

"The United States considers its own Amateur Service to be vitally necessary to the National defence and security because it provides a pool of personnel trained in the techniques of telecommunications, including skilled operators.

"It shall be the policy of the United States to foster and encourage the Amateur Service because the immediate availability to all world areas of the Amateur Services' frequencies and the Amateurs who utilise them are vital during times of emergency, whether such emergency be of a localised nature or national in scope."

Here is the policy of a country with untold thousands of frequency allocation problems compared to Australia prepared to support its Amateurs from the very top because they are far sighted enough and have learned the lesson of experience of the worth of the Amateur to the national good of their country.

In Australia the frequencies used by Amateurs may be in jeopardy and it is expected that support will be shown by the people who will be protecting the rights of the Australian Amateur Service and forming a futuristic policy on behalf of the Australian Government to retain the frequencies for the Amateurs of this country together with the requirements of all the other frequency users. If not, it will be a woeful outlook for a country whose geographical position makes it so vulnerable a target.

The worth of the Amateur to any country can't be weighed by how many times he operates in a week or whether he is actively on the air at all. It's his knowledge that is valuable and it is time the Amateur himself woke up and told a few people that fact. "Use them or lose them" . . . as we often hear mouthed should be a minor worry. It's the support of our communications people we expect right now.

FEDERAL EXECUTIVE

THE CONTENTS

A New Receiver Tuning Principle	2	Hints and Kinks:	
Reports Wanted on Weather Station Transmissions	2	Mobile Hint: A Pencil When You Need It	12
Amateur Television—Part Five	3	A "Tee" Trap for V.h.f.	12
Read-ing and Writ-ing for Emergency Net op-er-at-ors	7	Correspondence	14
Book Review:		Prediction Chart for July '58	14
"The Radio Amateur's Handbook"	8	I.T.U. Donations	15
"Quality Amplifiers for A.C. Mains"	8	SWL	16
21 Mc. Quad for 300 Ohm Feed	9	DX	17
Adjustment of Gamma-Matched Parasitic Beams	11	VHF	18
		W.I.C.E.N.	19
		Atomic Clock	19
		Notes	20
		Contest Calendar	20

A New Receiver Tuning Principle

Wide-Range British Receiver With Interesting Features

RECENTLY VE7AIK wrote to us to ask what we thought about the Rascal RA-17 receiver, and we could only answer that we didn't think anything because we didn't know anything about it. This surprised VE7AIK no end, and he promptly sent us a flyer he had on the receiver. This in turn prompted us to get in touch with the manufacturers, Rascal Engineering Ltd., Western Road, Bracknell, Berkshire, England.

The RA-17 Communications Receiver is expensive and it is made in Europe, so it isn't likely that we will see very many in the United States. The receiver is handled in Canada by Instronics Ltd., Stittsville, Ont., so some of our VE neighbours may be telling us about it over the air in the near future. The manufacturer was kind enough to forward enough information for us to pass along on what we think is a novel and interesting approach to receiver design.

Perhaps the outstanding feature of the receiver is the tuning method. The RA-17 has continuous coverage from 1 to 30 Mc. A large knob on the front panel is labelled "Megacycles"; it is set to the megacycle range you wish to tune. For example, a little dial face on the front panel indicates "2", so the receiver is currently set to tune 2 to 3 Mc. **The setting of this dial is not critical!** (One would expect it to be very critical, so why it isn't will be explained later.) You then tune the range with the left-hand large knob and read the frequency from the horizontal scale. That horizontal scale is a strip of film 60 inches long, with a calibration mark every kilocycle. To change bands you merely turn the "Megacycles" knob to the right range and, to confuse you a little more, no switching is involved!

Since this tuning device is so unusual, perhaps it had better be described before we get on with the rest of the receiver. The block diagram of Fig. 1 shows what is used in the front end of the receiver. The v.f.o. tunes 40.5 to 69.5 Mc., and its control knob is the one tied to the "Megacycles" scale on the panel.

Let's assume that the v.f.o. is set to 50.5 Mc. Although all of the harmonics of the 1 Mc. crystal will be hitting the second mixer, the signal in the plate circuit that gets through the 37.5 Mc. filter will be the beat with the 13th harmonic (13 Mc.; $50.5 - 13.0 = 37.5$ Mc.), and this 37.5 Mc. signal is applied to the third mixer. In the signal channel from the antenna, a signal at 10.5 Mc. would beat with the 50.5 Mc. v.f.o. and be heterodyned to 40.0 Mc., pass through the first i.f. stage and enter the third mixer. In the third mixer it would beat with the 37.5 Mc. energy to give a signal at 2.5 Mc., which could then be tuned in by the 2 to 3 Mc. receiver. (The 2 to 3 Mc. receiver tuning is tied to the 60-inch long scale that reads "Kilocycles".) It

should be apparent that under the above conditions signals in the range 11 to 10 Mc. would be heterodyned to the range 2 to 3 Mc. and could then be tuned by the 2 to 3 Mc. receiver.

But if about this time you're wondering how they keep the v.f.o. stable at this high frequency, the answer is, "They don't have to." Suppose the v.f.o. drifted to 50.6 Mc. Its beat with the 13 Mc. harmonics of the crystal would be 37.6 Mc., and its beat with the 10.5 Mc. signal would be 40.1 Mc. The beat between 37.6 and 40.1 Mc. is still 2.5 Mc., so although the v.f.o. drifted 100 Kc. the signal stayed on the same frequency at the input to the 2 to 3 Mc. receiver.

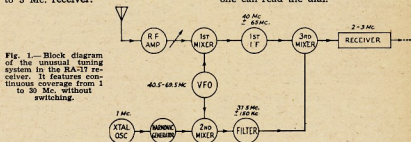


Fig. 1—Block diagram of the unusual tuning system in the RA-17 receiver. It features continuous coverage from 1 to 30 Mc. without switching.

The foregoing is not by way of implying that the RA-17 has oscillators that drift badly; all we can say about that is to quote (later) what the manufacturer claims. We did want to point out the ingenuity of the system, and the arithmetic was easier with a 100 Kc. drift.

To recapitulate a little, it should be apparent that the receiver stability depends upon the stability of the 1 Mc. crystal oscillator and the h.f. oscillator in the 2 to 3 Mc. tunable portion. Nothing is ever switched in the v.f.o. circuit, and it need be set only approximately to the right frequency for any given tuning range.

The arrow in the link between the r.f. amplifier and the first mixer in Fig. 1 is to indicate that tuned circuits are used here as well as some attenuation. Normally the front end might be set to a broad-band condition that requires no tuning. Should the signal be of such amplitude that it requires attenuation, 40 db. is available in steps of 10 db. Should a strong interfering signal be troublesome, the antenna range switch can be set to the appropriate band and the antenna tuning control rotated to peak the desired signal.

The tuning of the RA-17 is the major point of departure from conventional receiver design, and the remainder of the receiver incorporates what are currently considered to be desirable characteristics. Calibration check points every 100 Kc. are obtained from the 1 Mc. oscillator and a regenerative frequency divider. Six degrees of i.f. selectivity (obtained at the third i.f. of

100 Kc.) range from -6 db. bandwidths of 150 cycles to 8 Kc.; the three sharpest bandwidths are obtained through the use of crystal-lattice filters.

Two a.v.c. characteristics are available: a fast a.v.c. with a 200 millisecond discharge and a slow a.v.c. with a 1 second discharge. The S meter can be switched to read either "r.f." or "a.f." level; this is probably our usual S meter circuit for the r.f. level and a rectifier in the audio for the a.f. level.

An over-all drift of less than 1200 cycles during two hours after a cold start is claimed for the receiver, and after two hours it is said to be less than 200 cycles, which is about as close as one can read the dial.

The receiver is said to sell for around £400 (over \$1000 in Canada), and as yet no U.S. distributor has been appointed. We have been told that the receivers are already finding their way into Ham (and Commercial) shacks around the world, and some day it may be possible for some of us to log a little operating time with them.

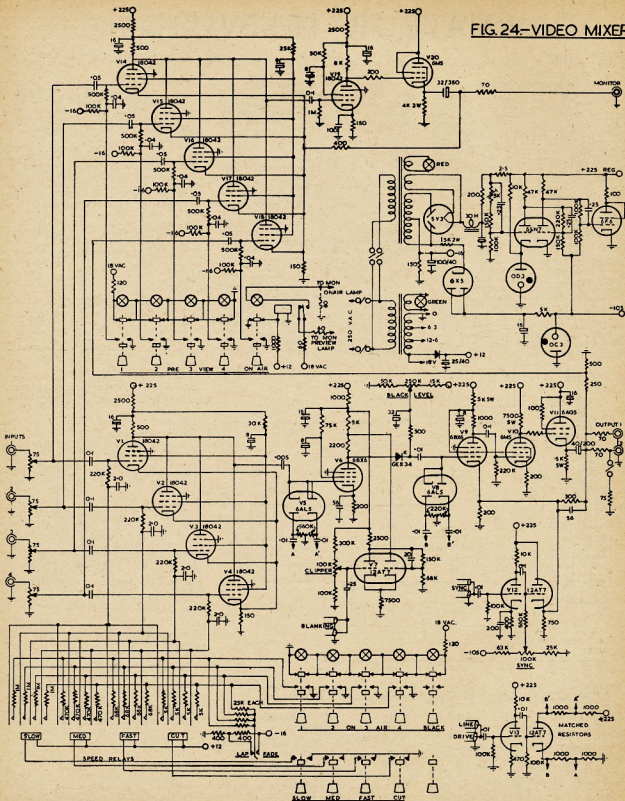
In the meantime, there is no good reason why enterprising "do-it-yourself" Amateurs cannot apply the tuning principle to home-made receivers and transmitters. —B.G.

REPORTS WANTED ON WEATHER STATION TRANSMISSIONS

The Commonwealth Bureau of Meteorology, in collaboration with the Australian Antarctic Expedition, has installed an automatic weather station at Davis Bay, Long. 133 deg. east. The station, which is running 40 watts input, is operating simultaneously on 7.315 Mc. and 15.845 Mc. Four transmissions take place daily, viz., 0035, 0645, 1205, 1855 GMT. The signal which is c.w. consists of (1) VNX repeated 14 times, (2) break sign, (3) the barometric pressure which is coded in the form of two letters of the alphabet, (4) break sign, (5) the temperature coded in two letters, (6) break sign, (7) the coded wind speed and wind direction. The whole is repeated twice and the letter V ends the transmission.

The Bureau would be glad to receive reports of these transmissions. Reports can be forwarded to Keith VK3ZED who is operating on 50 Mc. from Heidelberg, or to the Director, Commonwealth Bureau of Meteorology, Box 1289K, G.P.O., Melbourne, C.I.

FIG. 24.—VIDEO MIXER



lamps. These were all wired in series, and the break contacts wired across each channel lamp, using an 18 volt a.c. supply, through resistors, for the 6 volt lamps. Depression of a push-button removed a short from the appropriate lamp. Future development is to wire further external lamps in series, mounted on camera or appropriate unit, removal of a short from the group giving on-air lamp signals to c.c.u., camera, f.s.s., etc. Note that the fifth mixer push-button is labelled **Black**. This is the equivalent of "off air", but in t.v., even when no picture is being transmitted, sync, and blanking are, and hence the designation "black" for no picture.

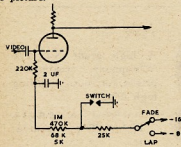


FIG. 25—SWITCHING

Preview Section

The five mixer tubes, V14 to V18, provide preview of the four incoming channels, and the outgoing "on air" signal. Switching is similar to that in the mixer, but with simplified circuitry. The supervisory lamps are arranged such that circuits are provided to a pair of lamps marked "preview" and "on air" on the master monitor, to act as a warning that the monitor might not be showing the "on air" signal, but a preview channel. A changeover relay is needed to provide this facility.

The preview amplifier is arranged as a feedback amplifier, with the five mixer tubes V14-V18 acting as the first tube. As only one is conducting at any time, this is legitimate, and a common cathode resistor is used for all five, and feedback taken to this point. This enables the bandwidth to be maintained to about 10 Mc., and the low output impedance needed to feed a high quality monitor at some distance away.

Power Supply

This is shunt regulated, and the difference from the series regulated unit described last month can be seen. The requirements are 225 volts at 120 mA. and as only the 5Y3 filament winding is used, an 80 mA. 385 volt transformer is not overrun, particularly with choke input. The 2.5 ohm resistor in series with the 225 volt line is a compensating resistor for 100% regulation, and is adjusted to give minimum ripple on a resistive load, say a 25 watt lamp.

Components

The push-button units are advertised currently in "Radio & Hobbies" at 7/6 a set, and the relays were from two U.S. Navy L.F.F. units, with the contacts modified somewhat to give four

separate "makes" on the switching relays. The tubes used in the mixers, 18042's, were used because they were available, but due to the low anode loads, any pentode of reasonable G_m can be used, such as the 6AU6, 6BX6, 6AM6, 6SH7, 6AC7, EF50, etc.

The use of 18042's with their 18 volt heaters required a special filament winding, but this 18 volt supply was handy in providing a useful voltage for the rectifier for relay operation, and for the supervisory lamp. The rectifier is also a "disposals" type, of the $\frac{1}{2}$ " unfinned variety, with six diodes in series for half wave rectification.

The 75 ohm input potentiometers should be carbon types. Mine are IRC wire wound, and their inductance causes some overshoot in the 3.5 Mc. region. They will be replaced when carbon types can be obtained. Some disposals gear has 100 ohm carbon potentiometers which would do admirably, if shunted with 300 ohm carbon resistors.

The 2 μ F. capacitors in the mixer grid R/C time constant circuit can be AEE Microcaps, PMG can types, or anything in between, depending upon space and what you have.

Simplifications

This can be done by the reduction of input channels, with two as an absolute minimum with perhaps key switching to the inputs of the channels to provide four inputs to two channels. The preview facilities can be omitted in toto, but with corresponding reduction in flexibility and scope. Twin triodes could be used for the mixer tubes, one triode per channel, as the anode loads are adequately low for triode wide-band operation. Use high mu tubes in this instance.

Adjustment

Using a c.r.o. on the output, terminated in 75 ohms, with no input, adjust the clipper preset control as in the c.c.u., described in May. Similarly check the operation of the **Black Level** and **Sync** front panel controls. Apply a signal of level between 0.7 and 2.0 volts p.p., at 50 Kc. or higher to one channel and check that the channel comes in and out with the appropriate push-button, and that the channel gain control has full control of level.

Apply two separate signals to two channels, and check the operation of the "lap" and "fade" time constants. Under "lap" conditions as the c.r.o. shows the outgoing signal decreasing, at about half normal level, the incoming channel should be about the same, the two adding to full output level. Under "fade" conditions, the outgoing signal should fall to zero just before the incoming appears. Check for all four channels.

Check that with about 0.7 volts p.p. at any mixer channel grid, 1.4 volts p.p. (with sync.) appears at the output, and also that 1.4 volts p.p. appears at the monitor output, terminated in 75 ohms. This ensures that all gains and levels are standardised. If not, adjust the overall gains of the mixer, or preview channel, until these conditions prevail. The feedback series resistor is the logical point to vary the gain.

Note: When testing gains, it is essential that the test signal used should be well above line frequency, 50 Kc. or

higher. If frequencies much below this are used, the keyed clamps will cause severe attenuation. In effect the clamp will attempt to obliterate the "hum" it sees on the amplifier tube grid, and its effectiveness is greater, the lower the frequency. In normal usage of course, the clamp operates on the blanking pedestal, but under test conditions, these pedestals are absent, at least before V6. This applies also in tests applied to the c.c.u., which was not mentioned when I described that unit.

In the sense that it inserts standard blanking and sync., this unit will replace those functions of the c.c.u. If the picture and waveform monitors are provided elsewhere in the chain, addition of camera control facilities in the video mixer, i.e. focus, beam intensity and target potential, will make the c.c.u. unnecessary. The master monitor to be described next month has both picture and waveform monitors, and can replace these functions of the c.c.u.

Intercom. Facilities

The video mixer becomes the key point in a transmission chain, and it is from this point that overall control of the system is effected. With the camera out on a long cable, two-way talk back between these two units is essential. In practice, programme sound is also fed to the cameraman, to help him co-ordinate his picture with the commentary, or sound. A "split" pair of headphones, with programme sound in one ear, and intercom. in the other, also has a carbon mike on a moveable arm fixed to one side of the headband. This enables the microphone insert to

(Continued on Page 17)

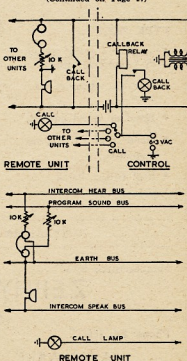


FIG. 26—INTERCOM

ZEPHYR MICROPHONES

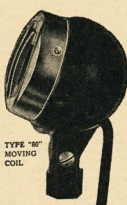


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- Ideal for transmission of voice or music.
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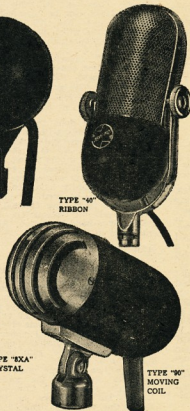
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Reading and Writing for Emergency Net Operators

BY NORMAN BURTON,* BERS11494

[Note.—The author's views are not necessarily those of the Publishers.—Ed.]

WHILST listening recently on the DX bands, the author was puzzled to hear a station calling CQ and stating it was "Victor Kilo Two Zulu Zulu Zulu." The first reaction was to grab the current List of Countries and see where this rare DX was. This proved to be disappointing as it was not listed, and the conclusion arrived at that it was a pirate. A day or two later, the call was heard again, very strongly and obviously a local signal; then the light dawned—it was the new Planned Phonetic Alphabet. Hastily sorting a pile of unpaid bills, demand notices, parking summonses, threats of legal action, etc., in short, the usual kind of junk that accumulates on the Amateur's desk, I found the complete list. By this time the station had gone off, presumably since no one answered. This reticence must be ascribed to the aversion of the average Amateur to working suspicious stations. The silence was clearly an invitation to study the new Planned Phonetic Alphabet.

Perusing the document from A to Z (this last letter can be pronounced either as in English, i.e. "Zed", or if you are an Elvis Presley fan "Zee", and either form is acceptable and correct; the latter form it should be pointed out, far from being new and modern, is Ye Olde Englishe form and was common usage until about the time of Nelson. As a young nation it is suggested the form "Zed" be used as this is more in keeping with the times.)

The document of the new Planned Phonetic Alphabet is full of surprises; not the least is the realisation that the planner was an expert in his field and that field is quite obviously pig farming. It has, however, the inestimable value of being a Planned Alphabet and is in consequence a Modern Planned Phonetic Alphabet, whereas earlier Phonetic Alphabets were just the haphazard efforts of the "hoi polloi" (Greek to you) and clearly were not suitable for general use by H.M. Forces, etc. The fact they were used at all must be ascribed entirely to the "Non-U" influence that was so prevalent during the Wars. There is not the slightest doubt that had we, during these hostilities, had the benefit of a Planned Phonetic Alphabet then the Wars might have been speeded up (on the other hand, of course, they could have been slowed down). All this casualness has now been rectified and we have a brand new Planned Phonetic Alphabet.

Let us examine it in some detail. For the first time ever the Phonetic Alphabet allows clear distinction between users who are U and Non-U. Take the letters K and L. These are given as K—Kilo and L—Lima, but

there is no indication as to how they are to be pronounced. If you are a Non-U you will naturally say Kilo and Lima (pronouncing the letter "i" as in eye), but if you are a U, you will show your better breeding and say Keelo and Leema. This allows you to air the knowledge of French so carefully belted into you with a cricket bat in the Second Form at good old St. Fanny's, the old Alma Mater—for Non-U readers, I will explain that "Alma Mater" is Latin for "Our Mother" and has nothing to do with a Hollywood personality whose vital statistics are 39-25-33 (unfortunately).

NEW PHONETIC ALPHABET

A — Alfa	N — November
B — Bravo	O — Oscar
C — Charlie	P — Papa
D — Delta	Q — Quebec
E — Echo	R — Romeo
F — Foxtrot	S — Sierra
G — Golf	T — Tango
H — Hotel	U — Uniform
I — India	V — Victor
J — Juliett	W — Whiskey
K — Kilo	X — X-ray
L — Lima	Y — Yankee
M — Mike	Z — Zulu

This division into U and Non-U is carried even further by introducing Greek letters, alfa, delta, etc. (Note to readers: I have had to use the Anglicised version of these letters as the printers, like those who printed the New Phonetic Alphabet had no Greek type.) Logically these letters should have been shown in Greek type but apparently the planner of the New Phonetic Alphabet decided against this logical course on the score that Amateurs would take a quick look at the New Phonetic Alphabet and say, "What's the use, it's all Greek to me." In actual practice, of course, they do this anyway, so the same effect has been achieved even though greater effort has been needed to achieve it. This is, of course, one of the benefits of having a thing Planned.

Having dealt with the division of the New Phonetic Alphabet into two, for U's and Non-U's, let us pass to a few more examples. Take "R". This is no longer Roger, but an emasculated sound "Romeo", and "J" is no longer Jig (or Jerk if you are American) but "Juliett", and "P" has ceased to be "Pip" or "Peter" and is now "Papa". Imagine a future aid battle. Ground calls up the fighters, "Red Papa calling Red Flight, can you hear me?" The Flight Leader, who is in aircraft J for Juliett, replies: "Romeo, Romeo; Juliett answering." At this point a third voice, probably the

enemy, butts in with "Romeo, Romeo, where art thou, Romeo?" and everyone is so convulsed with mirth that the action ends.

With female ground operators things can be even more amusing. Maybe on reflection this is the real purpose of the Planned New Phonetic Alphabet; it is our secret weapon. This is a truly monstrous thing, devilish in its conception, nothing more or less than a device to reduce the enemy's strength by making him laugh himself to death. Whether it is in accordance with the Geneva Convention is open to grave doubt.

Reflect again of a tough fighter pilot acknowledging a message "Romeo, Romeo." The thing is inhuman; it is not too much to say it is fendish.

At this point I feel we should all nip round to the "H" for Hotel and have a stiff "W" for Whiskey to overcome the shock. Taxation, too, is introduced, see "U" for Uniform.

On reflection the question arises should we as Amateurs, who pride ourselves on rugged individuality, use the code? The answer can only be found by having a look at a few examples. Take GSHFD—this becomes Golf Three Hotel Foxtrot Delta. HB9DZ—Hotel Bravo Nine Delta Zulu. The three letter W calls offer more scope. W9BPH is no longer William Nine Big Panama Hats but Whiskey Nine Bravo Papa Hotel, which sounds like a resume of a story from "Golden Gems for Little Gentlefolk", and the portable calls seem even more asinine. Take W4DL8/P, Whiskey Four Delta—Lima (see how the U and Non-U pronunciation complicates things?) Sierra Stroke Papa.

The more one examines it the more one becomes convinced that the best thing to do is to collect all copies existing of the New Phonetic Alphabet, have them arranged in date or numerical order, and then burn them: carefully omitting to have any carbon copies made before they are destroyed.

Summing up, therefore, it is clear this New Phonetic Alphabet was never intended for Amateur use; it couldn't be used. Hams all over the world would laugh themselves to death, so let us forget it and carry on as we are with our Able Baker Charlie, etc., even though this has not the advantage of a Planned Parenthod. After all, one could ask, "Is your planner really necessary?" The answer is definitely NO.

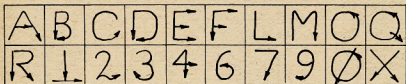
With the member of the Emergency Net, the position is far different. He HAS to use the code; there is no equivocation about the matter. Suppose he does not use the code. What happens? The message cannot be passed since it is not in the prescribed form as laid down by the planner and this can lead to serious repercussions. For instance, the lace mats for the tables in the Paratroop Sergeant's Mess may not be delivered and you will see at once

* 130 The River Road, Revesby, N.S.W.

the serious consequences such an event can have on Other Ranks.

Some difficulty will arise amongst the Emergency Net Operators and to obviate this, it is suggested a large chart be affixed to the wall with the New Phonetic Alphabet printed on it in letters of sufficient size as to be easily readable from the normal operating position, somewhat on the lines of an optometrist's test chart but without the graduations of type sizes. A draw curtain can be arranged to cover the chart when not in use, or when operating on the Amateur bands, so eliminating distraction and confusion. The chart will be of great assistance and once the position of the letters on the chart has been memorised the Phonetic word will be quickly found. Using this system the transmission and reception of a message need not be more than the usual shambles.

EXAMPLES OF PRESCRIBED FORM OF PRINTING



Note.—In actual message writing there is, of course, no need to print the small arrow heads on the letters; their omission will be understood by the reader.

Concurrent with the Planned New Phonetic Alphabet it is incumbent on the Emergency Net Operator to write all messages in the Prescribed Form of Printing to be adopted for the Writing of Telephone, Telegraph (including Wireless Telephone and Telegraph), Semaphore, Lamp and Heliograph Messages. This is MOST IMPORTANT as if the messages are not written in the Prescribed Form they cannot be read. It is suggested that practise in writing in this manner be done listening to Slow Morse transmissions.

As none of us know how to write, the planners have again come to our assistance. They have got out a chart

which is truly one of the wonders of the 20th century. It shows us how we can, with a minimum of brain fag, learn to write and so put down on a Prescribed Form of Message Pad any message we have the misfortune to receive. Exact details (see illustrated examples) are shown as to how to write each letter, where to start, where to end, which way the strokes are to be made (indicated by arrow heads) and even which way the curves (clock or anti-clock) are made. In short, it is the berries for the busy Emergency Net Operator, as with not too much practice he will soon learn to write.

Once he is able to write, he is presented with a second wonder: that of being able to READ the messages he has written down on the Prescribed Form of Message pad transcribed from the New Planned Phonetic Alphabet. This will give him a lot of pleasure,

for instance, he may see . . . xyt who-smt prppls alakselfnekd wpwlsith-teofnt wot in hell . . . and seeing this, he knows IN A FLASH he has written down a lot of gibberish. The realisation he has done this may make him glow with pride enough to put the modulation neon to shame or it may not.

What happens next? There are two courses of action dependent upon the moral fibre of the man himself. If he has any pride left he will at once switch off the rig and go and play two-up down at the local "Hi" for Hotel. If not, then his family are likely to find him some hours later with a wild look

in his eye muttering unintelligently and writing down on the Prescribed Form of Message pad short terse words which are nonetheless most descriptive of both the Alphabet, Planned, Phonetic, New, Services for use of, and the Prescribed Form of Printing to be Adopted for the Writing of Telephone, Telegraph (including Wireless Telephone and Telegraph), Semaphore, Lamp and Heliograph Messages.

BOOK REVIEW

"THE RADIO AMATEUR'S HANDBOOK"

We recently received copies of the 35th edition of "The Radio Amateur's Handbook", published by the A.R.R.L. This handbook is invaluable to the Amateur who wishes to remain "well up" on current affairs in the Amateur Radio world.

Each year portions of the "Handbook" are revised. In line with this policy, the 35th edition contains much information that is new. More space is devoted to "Semi-conductors." The chapter on H.F. Receivers has not been greatly altered, although a transistorised "Q Multiplier" is described. Chapter 6, H.F. Transmitters, has been altered quite a lot and new designs are described.

The 34th edition was better from the point of view of information for calculating the constants necessary in pin-networks. However, the space saved in shortening some popular chapters has been devoted to a more lengthy discussion on "Suppressed Carrier and S.S.B." Chapter 11 is now devoted entirely to this subject.

In Chapter 21, the "Monimatch Mk. II." is described together with the latest versions of Amateur built test equipment. The latest available (in the U.S.) tube types are included in Chapter 26.

The section that will make your mouth water is the "Catalogue Section" at the rear. It is a great pity that Australian Amateurs are unable to buy equipment that is available to practically any other Ham throughout the world.

The whole book is well written, easy to understand, and can be thoroughly recommended to beginners and experienced Amateurs.

Our copies from: Technical Book and Magazine Co., 295-299 Swanston St., Melbourne, C.I., and McGills Authorised Newsagency, 183 Elizabeth Street, Melbourne, C.I. Australian price, 46/3, plus postage 2/-.

"QUALITY AMPLIFIERS FOR A.C. MAINS"

Data Book No. 11

This inexpensive book gives information on a number of amplifiers as stated in its title. Full constructional details are given on a wide range of a.f. amplifiers and the book should find ready acceptance amongst "Hi-Fi" addicts and other audiophiles.

Our copy from Data Publications Limited, 57, Malda Vale, London, W.9. McGills will have it here in Australia during the month. Australian price is 6/6 approximately.

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21 Mc. Quad for 300 Ohm Feed

BY J. W. S. EDGE,* VK2AJ0

After hearing on the air the other day that one had to construct two Quads to keep one up in the air, I thought it was time that I at last wrote to "A.R." hoping to get some in print and perhaps help these fellows to keep their Quads in the air.

This Quad has been up at VK2AJ0's now for over two years, has withstood all the elements, and has assisted this station to work well over 100 countries on 21 Mc. since it first made its appearance on top of the tower.

Most of the data that could be found on Quads was for one turn on the radiator, but as at the time co-ax was scarce here, it was decided to try two turns and use 300 ohm ribbon. In due course, the completed Quad was erected, and with a field strength meter out in the paddock, tests were made against a ZL Special that had previously been the 21 Mc. standby.

Upon tuning the Quad with the shorting bar on the stub of the reflector, my mate and I were amazed to see that the field strength from the Quad was in the order of 3 db. better than the ZL Special. As we had previously proved a gain of approximately 7 db. for the Special, we were agreeably surprised with the result. Back-to-front ratio was better on the Special but forward gain of the Quad was best.

The best point of gain on the shorting bar is fairly critical, it worked out at approximately 3 feet up the stub in my case. Measurements are cut for approximately 21.2 Mc., and spacing is approximately 0.2 wavelength.

* Wallace Street, Coolamon, N.S.W.

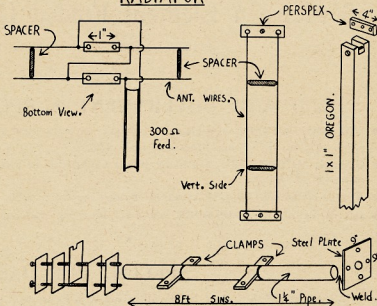
On the construction angle you will find when all is bolted together that you will have a light but strong beam, if directions are followed.

In the bottom diagram of the boom in the exploded end view, (1) is the 9" square steel plate welded to piping, (2) is the inside 9" square wood block, (3) one of the 1" x 1" spreaders, (4)

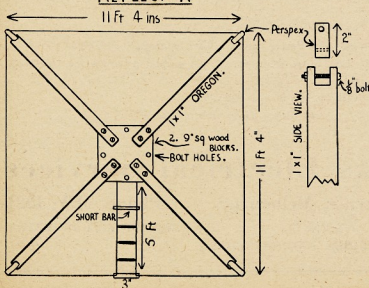
the outside 9" square wood block, (5) a light 9" square piece of steel plate (could be lighter in weight than piece welded to pipe), (6) bolts, four required to bolt all assembly together (I used 3 1/2" long 1/2" bolts).

It is most important that the spreaders are held by wood screws, either through the outer or inner wood block.

RADIATOR



REFLECTOR



I have not diagrammed the radiator, but construction is identical, except that no stub is used, and of course two turns are used. The perspex insulators are let into the spreaders, across horizontally, not vertically, as they are in the reflector. You will also have to allow at least 1" in that the spreaders for the radiator will be 1" longer than those in the reflector, because the insulators in the reflector protrude 1". 1/2" bolts are used to hold the perspex insulators in place. Wire used here was 7/029 enamel covered aerial wire, but most any wire is suitable, say 12 or 14 gauge.

I would be happy to answer any queries, either by letter or on the air, in regard to the Quad, but I am sure that if you do erect one you will be as pleased with its performance as I am. Go get that DX!

Timber and Hardware required:

- Approx. 66 feet of 1 x 1 inch Oregon.
- Four 9 inch square Wood Blocks.
- Perspex and Spacers for Antenna.
- Four 9 inch square Steel Plates.
- 8 ft. 5 in. of 1/2 inch Water Pipe.
- Bolts and Screws.

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EVENINGS AND SATURDAYS

Adjustment of Gamma-Matched Parasitic Beams*

Step Procedure for On-the-Ground Tuning

BY KATASHI NOSE, KH6IJ

AFTER having sweated through countless hours of "adjusting gamma match until the proper match is obtained" on some 40 assorted home-made parasitic beams from 2 to 20 metres, the conclusion is that this is easier said than done—and that authors, including myself,¹ have been prone to underestimate the work involved.

This article concerns a single-band 0.1 or 0.15 wavelength spaced, parasitic beam, co-ax fed and gamma matched—as simple and straightforward a system, mechanically and electrically, as can be devised.

THE GAMMA

Fig. 1A, the commonly used gamma-matched radiator, consists of loop ABCD to which is attached the half-wave radiator EF. The loop ABCD need not be rectangular, and Fig. 1B works precisely the same as Fig. 1A as has been demonstrated many times. This latter really is Fig. 1C in disguise, the shunt-fed grounded quarter-wave radiator, familiar to the broadcast industry, and works on the principle that the one-turn loop ABD is used to excite radiator AF through voltage developed across section AB. The series capacitor is used to tune out the reactance, which is always inductive. The quarter-wave section EA of Fig. 1A can be considered to be a phantom ground, which in the case of Fig. 1C is earth.

The gamma rod spacing is critical only at the AD end, and in broadcast practice it is usual to approach the radiator at a gradual angle. At Amateur frequencies, anything from No. 12 wire² to tubing equal in diameter to the radiator have been used (see Handbook nomograph); and spacings at the AD end on the order of one inch at 144 Mc. to 6 inches at 14 Mc., with intermediate values for other frequencies, have worked out successfully.

MATCHING TO FEED LINE

When the average Amateur speaks of "tuning a beam," he refers to two distinct processes. The first is that of adjusting the matching system, the gamma in this instance, to offer the proper termination to the feed line. The second is that of adjusting element lengths for maximum forward gain or front-to-back ratio. These two processes interlock to a certain degree.

The first process is carried out by tuning loop ABCD, together with appendage radiator EF and the gamma capacitor, to provide the proper termination at the desired frequency. Among the factors which influence this are:

If it is true that experience is the best teacher, the author has had a higher education in the adjustment of parasitic beams. This article gives you the essence of what he has found out in the course of tuning up some dozens of such antennae on a wide variety of Amateur bands.

- (1) Length of the gamma rod (about 7 inches for 144 Mc. to 44 inches for 14 Mc.)
- (2) Spacing and size of the gamma rod (spacings about 1 inch for 144 Mc. to 6 inches for 14 Mc.)
- (3) Gamma capacitor (about 7 pF. for 144 Mc. to 100 pF. for 14 Mc.)
- (4) Radiator length (460 divided by frequency in megacycles³).
- (5) Proximity of objects, including parasitic elements and their resonant lengths.

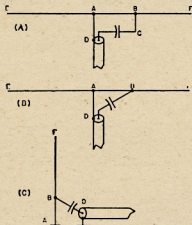


Fig. 1.—The gamma matched radiator and its family relationship to the shunt excited vertical.

Unless one of these parameters is fixed one can get hopelessly lost, since they all interlock to varying degrees. In this method the radiator length is fixed and the others worked against it. Remember, a coil-capacitor combination can be made to show the proper termination but is not the best radiator.

EQUIPMENT

A ratiometer (Monimatch, s.w.r. bridge, etc.) plus your transmitter, preferably low power, is all that is necessary. The simplest kind of s.w.r. meter or r.f. bridge, requiring only a few watts of power, is preferred.

³ Different sources give figures varying from 460 to 480. A large number of experiments tend to favour the former figure. I would like to hear about the experience of others.

The simple field-strength meter shown in Fig. 2 plus a v.o.m. with at least a 100 microampere movement is required if you want to make front-to-back adjustments. Use of a grid dip meter as a source of r.f. voltage is unsatisfactory in this application, nor is one required at any time unless used as mentioned later.

ADJUSTMENT OF GAMMA

Mount the beam on a convenient support at a height easily reached from the ground. The top of a stepladder is convenient—or even a fence post. The roof top is better but not necessary. Don't be too concerned about surrounding objects; tuning under poor circumstances is better than no tuning at all.

(1) Adjust the gamma to the suggested dimensions. Make the reflector 5% longer than the radiator, and the director 4% shorter. Additional directors should be successively 4% shorter.

(2) Install the s.w.r. meter at the transmitter end of the feed line and adjust the power output for proper operation of the meter at half sensitivity. This is done to extend the range during final adjustment. Only a few watts are required—the lower the power the better, since "hot" adjustments are to be made.⁴

(3) Move the s.w.r. meter to the antenna end of the feed line, placing it in such a position that the meter can be seen while making subsequent adjustments.

(4) Adjust the gamma rod length for minimum s.w.r. A temporary sliding shorting bar consisting of two battery clips screwed back to back is convenient. It is unlikely that this adjustment alone will produce a minimum.

(5) Adjust the gamma capacitor for maximum s.w.r. Alternate the adjustments between gamma rod length and gamma capacitor setting for minimum s.w.r.

(6) Finally, touch up by adjusting the radiator length slightly, but not more than one or two per cent. If a greater change is needed, go back to steps 4 and 5 and try another combination.

In all three of the latter steps the adjustments should allow the s.w.r. to go through a minimum and then rise again. By this time the s.w.r. reading should be so low as to make the reading unreliable on the scale being used, so shift to the most sensitive scale on v.o.m., if one is being used, or increase the sensitivity of the meter by cutting out more resistance if a Monimatch type is being used.

If at any time you should lose your place, or have any doubt as to the correctness of the adjustment, re-adjust.

⁴ Take due precautions, such as grounding, the inner conductor of the co-ax through an r.f. choke, to prevent high voltage from appearing on the antenna should a blocking capacitor fail. Additionally, it is suggested that the centre conductor be grounded through another r.f. choke at the antenna end.

* Reprinted from "QST," Mar. '58.

¹ Nose, "A Lightweight 14 Mc. Four Element Beam," "QST," Nov. '48.

² Nose, "A Lightweight 21 Mc. Three Element Beam," "QST," April '54; "The A.R.R.L. Antenna Book," p. 233.

HINTS AND KINKS

MOBILE HINT:

A PENCIL WHEN YOU NEED IT

Ever hunted for a pencil while mobilizing? Keep one on the top surface of the dashboard. A piece of magnet from an old speaker will stick to any convenient location on the dash. And an ordinary wooden pencil with about three wide-spaced turns of baling wire or equivalent (not copper) around the shaft will cling to the magnet. For long trips, a piece of scratch paper can be placed beneath the magnet, which will hold the paper firmly enough for quick operation notes.

—H. A. Thomas, WSHJM ("QST," Mar. '58)

A "TEE" TRAP FOR V.H.F.

The construction illustrated in Fig. 2 provides a means of connecting a series-tuned v.h.f. trap across a co-axial cable without actually cutting into the line. The idea was developed for use with a 144 Mc. converter that was picking up Television transmissions along with the 144 Mc. signals, but it may be used to free co-axial lines of other types of interference.

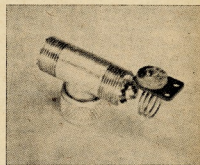


Fig. 2.—WBTP's series-tuned "Tee" trap. C and L, discussed in the text, form a series-resonant circuit at the frequency of an interfering signal. Capacitor illustrated is a 6 to 20 pF. trimmer.

The connector used in the assembly may be either a type 83-1T or a 31-008 (BNC), both made by Amphenol. If the former is used, a good joint between coil and connector can be made with a 1/4 inch No. 8 brass machine screw. A piece of solid copper wire may be used for the same purpose when the connector is a type BNC.

If possible, solder the rotor arm of the padder to the outside of the connector so it will be grounded when the unit is installed in the line. Naturally, tuning adjustments can be made with less difficulty if the rotor is grounded.

Values of C and L that will series resonate at the interfering frequency can be determined quite easily with the aid of a grid dip meter. If a grid-dipper is not available, the coil size may be varied—by the cut-and-try method—and the capacitor adjusted until the interference is suppressed. There is no reason why a trap of this type cannot be used to suppress a v.h.f. harmonic generated by a low-power transmitter. However, it may be necessary to rig a shield around the tuned circuit.

—R. V. Nedimyer, WBTP ("QST," Mar. '58)

insulators, between any convenient supports that are as far away as possible while still showing a half-scale reading with the back of the beam pointed at the dipole. If these adjustments are being made on the roof top, the pick-up dipole draped over the neighbour's roof is fine; otherwise, even draped over a hedge is satisfactory.

Run a long two-conductor lead from the dipole to the beam so that effects of adjustment can be watched. It is best that the lead wire be laid on the ground to preclude r.f. pick-up. Proceed as follows:

(1) Adjust reflector length for minimum pick-up. This adjustment is very critical, a change of one half inch producing a decided change in meter reading.

(2) Adjust director length for minimum pick-up. This adjustment is not as critical as that for the reflector.

(3) Increase the sensitivity of the meter or move the pick-up dipole closer (or increase power) as adjustment proceeds so that a half-scale reading is obtained at all times.

(4) In both (1) and (2) a minimum should occur as the proper length is passed.

(5) Reinstall the ratimeter in the feed line and check to see that the s.w.r. has not changed materially. If it has, re-adjust according to the procedure given previously, keeping the radiator length a fixed quantity except for minor touch-up.

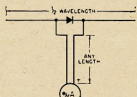


Fig. 2.—Sensitive field strength meter using crystal diode (such as a 1N34) and microammeter. The latter should have a range of about 100 microamperes full scale, and may be the meter in a volt-ohm-milliammeter if a suitable low current range is incorporated.

In practice, a change of one half inch or so in element length will not be noticed at the receiving end of a contact, but it is comforting to know that it is "on the nose." Raising the beam into position does not change the s.w.r. as much as one is led to suspect, and this method is the next best to making adjustments with the antenna in its final position.

ERRATA

In the "Amateur Television" series of articles, the author has pointed out the following omissions and alterations:

Part 1.—Sync. signal generator circuit drawing, V7B cathode resistor is 4700 ohms.

Part 2.—April, page 6, column 1. Paragraph beginning "Stage 2 (V9)" amend figure in denominator of equation from 2200 to 120. Throughout text, for cascade, read cascade, when referring to c.r.t. phosphors.

Part 3.—Circuit Fig. 15. Coupling capacitor omitted from anode of V2 to clamp V4 should be 0.004 uF.

radiator to the calculated length and start all over. The sequence is: gamma rod, gamma capacitor, and radiator length for touching up.

Depending on size of the beam and the frequency, you may have to duck out from between or under the elements after each adjustment, if such movement results in a change in the s.w.r.

If a satisfactory minimum s.w.r. cannot be attained during any of the three latter adjustments look for:

(1) Radiator length too far off, preventing resonance (see below).

(2) Poor Q in gamma capacitor and loop system. The W2VS type of concentric capacitor⁵ has excellent Q and is preferred. Spacers should have low power factor. Plastic tape is unsatisfactory, and you will have one big mess if you use high power.

(3) Poor co-ax connections. Solder all co-ax to connectors. In one instance a right-angle connector showed an open circuit only when installed in a line.

(4) Beware of unmarked surplus short lengths of co-ax in connecting the ratimeter. It is better to cut a short length from the same piece used for the feed line.

(5) Telescoping elements not making electrical contact. Test with an ohmmeter. If there is no coating of grease on the inside at the telescoping joint, put one on and tape up the joint with plastic tape after final adjustment of length.

(6) Excessive harmonic content or parasitics in the r.f. source, either through mistuning, or inherent in transmitter.

(7) Ratimeter improperly calibrated or not working properly. Test with a noninductive resistor—not at the bridge co-ax terminal but at the end of the co-ax where it connects to the gamma.

The first mentioned item is the most frequently occurring trouble and usually accounts for freak gamma dimensions or capacitance. Check the resonant frequency by shifting the transmitter frequency 200 Kc. higher and lower and observing where the minimum s.w.r. occurs. If the minimum occurs at other than the desired frequency, re-adjust the radiator length and repeat all steps.

If none of these measures work, couple a grid dip meter to point D in Fig. 1A, with the feed line off. You will find several dips; the most pronounced for the radiator, a less-pronounced one higher in frequency for the director, and another lower in frequency for the reflector. This will give you an idea as to how far off resonance you are. There have been cases where resonance occurred outside of the range of the transmitter.

ADJUSTMENT OF DIRECTOR AND REFLECTOR

The second phase of tuning will be omitted by most Hams, as formula lengths work out fairly well. Adjustment for maximum front-to-back is much easier than for forward gain because the former is quite sharply defined. Moreover, it is more dramatic when demonstrating the beam!

String up a half-wave dipole with a diode detector, using pieces of string as

⁵ Reynolds, "Simple Gamma Match Construction," "QST," July '57.

100,000 hours

WITHOUT FAILURE

A. W. V. RADIO RECEIVER LIFE TEST NO. 55

Life Test Conditions	- 2 hrs. 00. 20 mins. off.
Cycling	- 10 Brand Line Receivers. (4 valve) 12 Brand Line Receivers. (5 valve)
Life Test Receivers	- 1,000 hours.
Life Test Duration	- 100
Total Valves Tested	- 10-3-58 to 28-4-58.
Production Period	

Valve Type	No. Tested	No. Failed	Fault	Hours Failed
6X4	22	0	0	0
6X5B	22	0	0	0
6BY7	10	0	0	0
6AQ5	12	0	0	0
6AD5	12	0	0	0
6AV6	10	0	0	0
6AU6	10	0	0	0

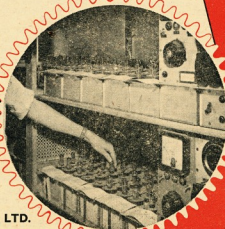
Total hours attained -- 100,000
Maximum hours attainable -- 100,000
% Maximum hours attainable -- 100%

M. J. Everett...
W. J. Everett.
Valve Testing Laboratory
28/4/58.

In keeping with their policy of maintaining the highest possible standards of valve reliability, the Amalgamated Wireless Valve Company employs many rigid life tests.

One such test is the 'Radio Receiver Life Test'. In this test, samples of Radiotron Valves taken at random from production are fitted in brand line receivers and operated for varying lengths of time under cyclic "on/off" conditions identical to those encountered in the field.

The life test report shown here demonstrates as a result of this policy, the outstanding reliability that is to-day, synonymous with the brand Radiotron



VC4.58

AWV

RADIOTRON

VALVES, PICTURE TUBES AND TRANSISTORS

Manufactured by

AMALGAMATED WIRELESS VALVE CO. PTY. LTD.

47 YORK STREET, SYDNEY

CORRESPONDENCE

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

S.W.L. GROUPS

Editor "A.R.," Dear Sir,

As President of the VK5 S.W.L. Group I would like to comment upon the letter by Ian Hunt and published in "A.R." in May. Firstly, I would like to say that, almost without exception, I heartily endorse his remarks. A great deal of good can come from the formation of S.W.L. Groups in each Division, both as regards personal benefit by the individual, and collective gain by the W.I.A. It is certainly incumbent upon all members of the Institute, whether Amateur or Associate, to encourage the activities of S.W.L. Groups.

The point upon which I wish to comment is contained in the second paragraph of Mr. Hunt's letter which reads as follows: "However, I am rather perturbed at the apparent lack of interest in States other than Victoria, in the promotion and encouragement of Short Wave Listener Groups within the various Divisions of the W.I.A."

As far as the VK5 Council is concerned this criticism does not apply. Ever since our Group was formed in February 1955, Council has given every encouragement to s.w.l.'s, and it is certainly not from lack of official support that our Group is not as active as we had hoped. Council has always been ready to assist the Group and individual Amateurs have provided talks and lectures on numerous occasions.

Frequent publicity has been given the Group over VK5WI and through the W.I.A. notes in the Press and it is largely due to this that the Group has achieved a measure of success.

I quite admit that the VK5 Group has not been able to supply regular notes for "A.R.," mainly due to most of the Group members being more interested in the technical side of Radio than in Short Wave Listening. It is apparent that the future of the VK5 Group lies in promoting the technical aspect and most of its members are keen to obtain the A.O.C.P.

In closing, I would like to acknowledge the efforts of Ian Hunt in promoting the interests of S.W.L. Groups in VK. The VK5 Division is most appreciative of his work and we wish him every success in the future.

—James N. Paris (WIA-L5006).

Editor "A.R.," Dear Sir,

Correspondence subsequent to a letter written by myself being published in the May issue of "Amateur Radio," leads me to write further in an effort to allay any misconceptions which may have arisen concerning S.W.L. Groups, and my comments thereon.

I wish firstly to state that my letter was not intended as a condemnation of any particular Division or Divisional Council, but was meant merely to point out the need for attracting newcomers to Amateur ranks.

In furtherance of this aim I feel that S.W.L. Groups are undisputably an ideal

method, if properly organised, of attracting persons who would not otherwise come into contact with Amateur Radio or the W.I.A. This is the primary and most important function of an S.W.L. Group. The aim of such a Group is not to train young members as Amateur operators, although it can be seen that a natural outcome of Group activities is that many members will finally take this step. I wonder if such would be the case if no facilities were provided to capture the interest of these persons and hold it up till the time that they are in a position to sit for the examination?

As far as the hard work necessary in putting an S.W.L. Group on a sound footing is concerned, I might point out that here in Victoria the S.W.L. Group is run by the listeners for the Division. Since the formation of the Group much sound advice has been received from the Divisional Council as a body and also from individual office-bearers and members, but apart from this advice and a restraining hand, when required now and then, no further call has been made for assistance in running the Group by its members. However, the friendly attitude and encouragement given to the Group members by all other Full Members of the VK3 Division has left nothing to be desired, and for this we are very thankful.

As far as conditions pertaining in other States are concerned, I do not and have not at any time claimed to be an authority. I do know this though, here in VK3 we have a successful Group organised. If it can be done here, why can't it be done in other places, too?

In conclusion, I would like to say that if any person is interested in s.w.l'ing or in the formation of S.W.L. Groups, they need only write to me at 211 St. George's Road, Northcote, N.16, Vic., and I will try to be of as much assistance as possible. I hope very soon to have obtained that coveted Ticket and I want to be able to operate until I can be classed as an Old-Timer. I won't be able to if there are no Ham bands though, and I still maintain that they can only be preserved if we strive to keep the number of active Amateurs increasing.

This can be done by attracting new members by the formation of Short Wave Listener Groups.

—Ian J. Hunt (WIA-L3007).

SHORT WAVE LISTENERS

Editor "A.R.," Dear Sir,

Re s.w.l.'s not receiving acknowledgment from Hams. Well the s.w.l.'s may only have themselves to blame.

I was a s.w.l. around 1930 and had little trouble as my s.w.l. card was accompanied by a self-addressed stamped envelope.

However now, S.W.L. Groups could work in with the W.I.A. for an exchange of cards, etc.

Each S.W.L. Group could have its cards printed in bulk and these cards designed to give the information necessary for a complete report.

—W. N. Short, VK2ARA.

PREDICTION CHART, JULY '58

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S.W.L.

Ian J. Hunt, WIA-L3007
211 St. George Road,
Northcote, N.16, Vic.

Well here we are again after an unfortunate break in S.W.L. news which, however, was due to pressing other business.

As a result there is a great deal of news to catch up on. The Card of the Month Contest is one matter which dates back as far as May. The results to date of this contest are as follows: May—12 cards entered; card from CREAQ submitted by Ian Hunt judged the winner, June—13 cards entered; card from C.B.C. Radio Canada submitted by Maurice Cox judged the winner; and for July another card submitted by Maurice, namely that of G3GYH.

N.S.W. S.W.L. GROUP

The inaugural meeting of this Group was very well attended and official listeners' numbers were allocated to financial members present. So far to my knowledge at least 22 of these numbers have been issued. At this meeting an address was given by Norm ZALF on various aspects of s.w.l'ing and some very interesting QSL cards were displayed.

Group office-bearers elected were: President—Barney Smyth; Vice-Presidents—Dawson and Bob Luther; Secretary—Barry Cartwright; Assistant Secretary—Bruce Forman; QSL Manager—David O'Leary.

The first general meeting of the Group was held on 2nd May with 15 members present. The lecture was on the Group's new QSL card, who is QSL Manager for the VK2 Division. Frank lectured for two hours on the functions of the QSL Bureau, design of QSL cards and postal regulations concerning QSL. The lecture was very well received and numerous questions were asked. No doubt some interesting cards will appear as a result. The chaps all wish me to express their thanks for your efforts Frank.

Any VK2 s.w.l.'s who wish to join this Group can contact the Group Secretary, Mr. B. Cartwright (WIA-L2002), 43 Chelmsford Road, Northcote, N.16, Vic.

Our congratulations are extended to the New South Wales Division on the formation of an S.W.L. Group and we hope that the move will prove to be a wise step in the right direction. However, you VK2 s.w.l.'s, remember that your Group will only be as successful as you make it yourselves and that some hard work will be necessary. So rally around and give it your support and then watch yourselves go places.

Don Granley, to whom we may now refer to as WIA-L2022, has written a couple of letters telling me a little of what goes on in Hailbrook. Don states that he is very interested in the current Contests ("A.E." for April '58 for details) and is awaiting a batch of 2,000 QSL cards from the printer, so it looks as if he is going to be kept pretty busy with his listening. He also throws out a friendly challenge on behalf of VK2 listeners to all other States to try and beat them in the contest. So go it to all you s.w.l.'s everywhere and we'll see just which State can top the poll. Don states that Dave Jenkin and the other VKs have his sympathy. His faithful old tri. is at present undergoing its first overhaul for eight years and should no doubt be working much better by now. Money is not a great used by Don are the RX section of a No. 19 set, an SC4322 for v.h.f., an all-band converter for use in front of the No. 19, with the antenna a vertical. Other equipment coming up includes a 2 and 6 mx converter and a pre-amplifier.

Well that finishes the news from VK2 for this month. We hope to hear more from you chaps up there between now and the next issue of the magazine.

VIC. S.W.L. GROUP

The April meeting of the VK3 Group was very well attended in setting the general business of the Group on a sound footing. Discussion took place on many and varied topics and some very good ideas concerning future policy and activities were forthcoming.

At the May meeting of the Group 15 members were present including two new members, Ron Louell (W14Y) and Trevor Howard (Blackburn). Our old friend George 3WJ was also present and just as interested and enthusiastic as ever. Apologies were received from our President, Ken Poynter, and Geoff Harris whose antenna we were told had unfortunately blown down during the recent very high winds in Melbourne. We hope you are interested by now Geoff. The job of compiling reports of band conditions for the purpose of inclusion in the monthly "A.E." column, including details of stations heard, was placed in the capable hands of our Assistant Secretary, Maurice Cox. All who have reports for this purpose can contact him and Geoff Harris at MXY 110 Ext. 383 to pass on the details.

After further discussion of a general nature Ian Hunt demonstrated to the members an antenna tuner which covers all Ham bands by band switching and briefly described its mode of operation as well as explaining how useful an adjunct it can be, and how cheaply a good antenna tuner can be built.

No doubt you read in the June issue of "A.E." of how Raymond Bedson, one of our blind members, has passed his examination for a call sign. Raymond, who now has the call sign 3K3ZEB, was one of the early members of the VK3 S.W.L. Group. He was given the number of WIA-L3008. I wish to convey the heartiest congratulations of the rest of the Group members to him and to express our wishes of all listeners throughout the country. A very fine effort indeed and also a fine example to those other members of our Group who unfortunately undergo the same handicap as he. We are looking forward to hearing something of Raymond's exploits now he is "On the air". He always was a very keen listener and not so long ago was instrumental in alerting the Melbourne v.h.f. gang upon the occasion of a break through in the 2m band.

Correspondence received from s.w.l.'s within VK3 includes letters from Ian Thomas, of North Clayton, and Horace Barling of Geelong. Ian states that he is very interested in joining the Group and I hasten to assure him that he will be very welcome to do so. If any others are interested can along to the meeting at 8 p.m. on the last Tuesday of each month. They are held at the W.I.A. Rooms, 191 Queen St., Melbourne.

Horace is unfortunately an invalid and therefore can't get about very much. However, despite his handicaps he made his own t.v. antenna, which also works for his listening.

Well, the RX used for most of his listening is an American "Zenith" 5-valve Trans-Oceanic, with shortwave bands and broadcast, two loop antennae, a telescopic whip antenna and provision for an external antenna are built in. Speaker or phones can be used as desired. The main antenna is an indoor antenna, about 40 ft. high. Horace, however, being a pensioner, cannot easily afford to purchase the various radio magazines which he would like to, and he has asked me if I can do anything to help. I'm sure he won't mind me mentioning this, and anyway it is something I have had in mind for some time. If any of my readers have any issues of the more popular radio magazines which you don't want, I would be very pleased to help. There are a number of persons who could make good use of them including people in the same boat as Horace. I would like to even get out of the house, and also some of our very young members who are still attending school and only have a few shillings pocket money each week. Here's your chance to help some of these chaps, so if you can send any of your old back issues of magazines or old handbooks or old copies of W.I.A. rooms or bring them along to the Institute meetings I'll be most pleased. I can promise you that they'll go to those people who really deserves them. This project of help for other Radio pals could possibly be adopted in other States too. Don Granley of the Geelong gang could drop around to see Horace at 213 Little Malop Street too.

TASMANIA

And so now last but not least in my mail bag for this month comes a letter from Rod de Ralouac of Launceston, Tasmania. Rod states that interest in the Northern Zone of VK3 has lived up to late and that he hopes soon to be able to let us know of a few more s.w.l.'s in that part of the country. He is using the old faithful 6-tube superhet covering 80 to 10 mc, with plug-in coils, and has just about finished building a 28A2 preselector. His next project will be an 11 or 12-valve double conversion job.

The antenna farm which helps to bring all this good DX seen pretty well every month without fail in the DX column, conducted by that same worthy man Frank 2QL previously mentioned, is as follows: (1) Half wave 7 Mc.

doubtlet, (2) Half wave 14 Mc. with tuned feeders, (3) Cubical quad antenna for 14 and 21 Mc. mounted on a 40 ft. mast. Rod states that the 23 mx quad works very well on 10 mx too and thoroughly recommends this type of antenna to all s.w.l.'s who contemplate building a beam. He points out that they are simple to build and get into operation, easily supported and rotated due to their light structure, and which is more important to make s.w.l.'s cheap to build. His beam has stood up to a 70 m.p.h. gale without suffering any damage at all. At present his total of countries heard is 148, 10 phone and c.w., with 94 countries confirmed. During April he heard a total of 88 countries. Rod also says that if anyone is interested in his cubical quad, and its associated supporting structure which enables it to be lowered to the ground quite easily, he would only be too pleased to help if they drop him a line. His address is 29 Gorge Road, Trevalyn, Launceston.

Well I think that pretty well wraps up this month's doings. Remember, if you have any news let's hear from you without fail. Also, if you wish to be featured as S.W.L. of the Month, write and tell me about your background, that is excluding gaudy sentences of course, and also about your activities.

Low drift

Crystals

FOR

AMATEUR

BALANCE

ACCURACY 0.02% OF

STATED FREQUENCY

3.5 Mc. and 7 Mc.

Unmounted £2 70 0

Mounted £3 0 0

12.5 and 14 Mc. Fundamental

Crystals, "Low Drift,"

Mounted only, £5.

THESE PRICES DO NOT

INCLUDE SALES TAX.

Spot Frequency Crystals

Prices on Application.

Regrinds £1/10/10

MAXWELL HOWDEN

15 CLAREMONT CRES.,

CANTERBURY, E.7,

VICTORIA

Page 19

NOTES

FEDERAL

New South Wales: Messrs. B. H. Anderson, VK2AND; G. G. Hall, VK2AGH; L. H. McMahon, VK2AC.

Victoria: Messrs. R. A. C. Anderson, VK3WY; F. P. O'Dwyer, VK3OF; N. L. Storek, VK3ZO.

Queensland: Messrs. S. R. Baxter, VK4FJ;
J. G. Files, VK4JF; A. Harris, VK4TN; H. T.
Hewitt, VK4PD; J. T. Hope, VK4XL; L. E.
H. Mallison, VK4LM.

South Australia: Messrs. A. R. Anderson, VK5GM; F. F. Bourne, VK5BU; G. M. Bowen, VK5XU; A. H. Brooks, VK5KG; R. G. Harris, VK5RH; B. R. Palk, VK5FQ.

Western Australia: Messrs. J. A. Cook, VK-8JA; J. R. Elms, VK6BE; E. C. Machin, VK6VM; J. R. Rumble, VK6RU; S. J. Smith,

Tasmania: Messrs. J. C. Batchelor, VK7JB; M. H. B. Hurburgh, VK7MH; L. R. Jensen, VK7LJ; K. E. Mullin, VK7KA; W. N. M. Nisbet, VK7BN; D. M. Watson, VK7DW.

Eavesdropped from VK9JF, when on sked with WVKKD on 28th May: "Will be leaving Cocos in about eight days and due arrive Singapore 20th June . . . no date set for wedding. My new QTH will be care Cables and Wireless, Penang . . . was there about four years ago. I hope to sign VS2JF . . . the rig stays on Cocos but do not know if any of the crew are coming here are interested." Congratulations and best wishes for the marital stakes. Mike.

A picturesque QSL card is that of ZL1AQC, of Napier, New Zealand. The operator Doug, previously held the well known call sign of ZK1AB at Raratonga, Cook Islands. He retired from business activity to live at Napier. His station is located 300 feet directly above Hawkes Bay. Doug, welcomes VK contacts and will send one of his technicolor QSLs to all stations contacted. He will accept QSLs and outstanding ZK1AB contacts. QTH is 8 Ormond Road, Napier, N.Z.

Each year the U.S.S.R. Central Radio Club holds an international c.w. contest. Each year the worldwide participation is widespread. Each year the promoters send to VK some thousands of brochures giving details of the contest. Each year these brochures arrive AFTER the contest is over. This year the contest was scheduled for May 10 to May 11 and the details arrived on May 17. A request was sent the promoters two years ago asking for at least one copy by airmail so that publicity can be given the event.

ZL3VB, Chatham Island, can be found on 14625 Kc. and also on 3584 Kc. around 1930 E.S.T. VK2FR, a Met. Officer on Lord Howe Island, plans to use 14 Mc., and VK2AIR expects to be active from the same location for one week in July. It is rumoured that both these islands are likely to be classified as new countries, shortly by the A.R.R.L.

—Ray Jones, VK3HJ, Manager.

Compiled by W.I.A. Fed. Contest Com.

★
R.D. CONTEST—

Dates: Saturday, 16th August, 1800 hrs.
E.A.S.T.; Sunday, 17th August, 1750
hrs. E.A.S.T.

VK-ZL DX 1958—

1st and 2nd Week-End October.

An interesting and educational lecture was presented by President Lionel at the May monthly meeting of the Hunter Branch and this time even Bill Hall kept awake. Those present being 2ARV, 2AQR, 2CS, 2ZL, 2AOR, 2ZDL, 2AFA, 2QB, 2AEE, 2XT and Associates. Hughes, Finch, Gray, Sutherland, Davis, Stobbs, McLoughlan, Richardson and Prigg. The night was complete with a couple of films. Due to the fact that the writer has been

On holidays information is very scarce, hard to hop to pick up some scandal at the time. Talking of Bill, I remember that he was very popular in Japan, and the rumour has it that he is shooting off to Japan when JC's threat to use a s.s. bears fruit. I remember that Haruki Murakami, who is now in Roseville, visited ZL, ZLT and met ZMR. I remember in the open, there was more room for manoeuvre. Before we left, I was with his brother ZL and VKK. On my trip I was able to prove that JC's 2ASF, cold, cold south was only a myth. I remember that ZL was very popular in Japan. Pop 2AHL, and Bill ZLZ bidding the latter on voyage on his move to VR land in July. I remember that Bill ZLZ was very popular in Japan, excellent results and to date with his portable coil sign of ZLAUL has been using the gear. I remember that ZLZ was very popular in Japan. ZLZLMN, Wal proposed a toast at the Palmerston North Convention before the multitude of

To fill in, may I mention the extremely bad operating on 40 these days. Apparently these jokers haven't heard of the dummy antenna, nor have they been told that the radio is not to be used on inflicting their horrible noises on the air. This does not refer to those "pickello petals" who have no ticket and general knowledge of the radio station, but to the culprits. Other noisy noises are the canaries, those who whistle, out of tune of course, to see if the r.f. meter moves or the pea-lamp brightens. I'm afraid that the radio is being used to the detriment of to point his Wouff Hong. Overseas invaders are making enough inroads into our bands without these jokers making a mess of what is left.

Don't forget the next meeting which will be held at 8 p.m. on 11th July at the University of Technology, and Bill Hall puts out the welcome mat at his premises on Wednesday, July 23. See you all there.

George Robertson's (3WJ) lecture at the last meeting was somewhat different from the usual run and was the most thought-provoking we have had for some time. He gave a resumé of a recent civil defence course he took at Mt. Macedon where he attended as a W.I.A. representative. The course itself is run by the Commonwealth Gov. and from all accounts is of very excellent nature. As George explained, the whole basis of civil defence is self preservation and the course defines the ways and means of bringing this about, firstly by anticipating the types of attack to be expected, and secondly by working out a programme of defence against each form of attack.

The most likely methods of attack in any future conflict seem to be nuclear, gas or bacteriology. Nuclear warfare is probably the most spectacular due to its tremendous powers of destruction. Should the attacker be interested only in total destruction this is probably the likeliest form of attack, but for obvious reasons it would not be the best form for an enemy who hoped to use the country's

resources after the attack. This is where gas warfare would come into its own, as with modern gases whole nations can be wiped out and the country's resources left intact for future use. Nice thought! Fortunately, bacteriological warfare is dragging its feet somewhat and is virtually ineffective as a major tool of war at this stage.

Having outlined the method available, George then went on to describe the available means of effecting the attack. He pointed out that the forms of attack in the case of an atomic attack, the task is really formidable because of the terrific destruction which takes place. He pointed out that the attack is made by the after effects of radioactivity. Rescue operations under these conditions have mostly been made by foot as human vehicles have rendered inoperative by debris on roads. This means, of course, that any radio gear taken into the field must be of the lightest possible construction. It must also be composed of readily available materials. The equipment must be destroyed as much by radio activity and cannot be used in this type of equipment in the field. The equipment must be portable and only play a secondary role in an area affected by a nuclear attack as most reliance will have to be placed on the use of the human element of communications which in our case is the P.M.G.'s Department. However, the Amateur Radio Society has been working hard in the field of operating, but more in the capacity of a maintenance man or instructor than in the same scope, no doubt, as a portable operator.

Some of the data George gave regarding a nuclear explosion of the 40 megaton variety was that the size of the fireball would be about the size of the bomb of this size dropped on Melbourne would cause complete and utter destruction of everything within a radius of 40 miles. The crater zone would be about 4 miles across and 100 ft. deep with a 100 ft. lip around the circumference. Needless to say, rescue results would be nil. The radius of the mushroom cloud and those who did survive would probably die from radiation anyway. The fall out from the explosion would be deposited over a 100 square mile area of land outside the 25-mile radius. Rescue operations for such a blast would probably be confined to a few hundred square miles of square miles of country. The horrors of an atomic attack are really frightening and the thought of a nuclear war is a nightmare before another one of these is let loose.

The question of civil defence is very much to the fore in N.S.W. but in Victoria the activities of the V.C.D. are more limited. The fact that more civil emergencies occur in the latter State than in the former has led to the need for unified co-ordination of the various agencies concerned. The fact emerges that N.S.W. has a civil defence organisation financed by its Government whereas no such organisation exists in this State. The V.C.D. is a voluntary organisation under the provision of the W.I.A. is an active participant in C.D. in that State but we have still to make arrangements for the V.C.D. to be involved in the VK3 Division to initiate much in this direction on a civil basis, but there is nothing to prevent the V.C.D. from being active in this sphere of activity and what could be better than joining in field days, transmitter hunts, etc. The V.C.D. is a very useful organisation for necessary activities and the organisers of these functions are yearning for more support, so that they can be more effective in their lightning and thought-provoking address.

By the way, arrangements were made, after several requests, for W.I.A. car badges to be made available to members and the price is 30/- each. Up to date there have been no orders, so what about it, chaps?

Visitors at the meeting were Ken Robinson and Max Spiller, and new members admitted: Full Members—G. W. Small (3ZEA), S. L. Skinner (3AFL), D. M. Eales (3LQ), D. G. G. Johns (3ZDJ), D. Guy (awaiting call). Associates—I. C. Knight, R. F. Bowley, J. W. Martin, A. Ormond, J. W. E. Edmonds.

• SILENT KEY:

It is with deep regret that we record the passing of:—

VK5BY—Dougall White
VK6FT—Fred Tredrea.

wise the Group will become non-representative and could become handicapped in making its decisions.

Mrs. Mary advises that fairly comprehensive details of the ABE are now available from the rooms at 3/6 per copy. This should help to satisfy the many requests for this information.

Congratulations to Ray Elliott, 3ZAE, on attaining 100 two-way contacts on v.h.f. bands. Ray was presented with his certificate at the meeting. It is hoped to make the next lecture a v.h.f. Eight days President has this in hand. Perhaps Ray will give us the low-down on these bands.

It may not be generally known that the books recently reviewed in the magazine are available to members through the library. To save you looking back, the titles of these books are the "A.R.R.L. Handbook" and "Quality Amplifiers for A.C. Mains". Further additions are expected from time to time.

WESTERN ZONE

Towards the end of May, Stawell and district radio enthusiasts had the pleasure of being present at Jim Farrer's (3BDP) wedding. The lucky young lady was Miss Myrtle Davidson. We all wish Jim and Myrtle all the best of happiness in their future lives. Alan 3HIL, who spends most of his Haming time on the DX bands, is now planning to operate more on the 10 m band. Merv, 3AFQ, who recently completed building his own t.v. set, has been obtaining excellent results. Congrats, Merv. Bert 3EP, of Warracknabeal, joined in on a zone hook-up recently. His signal was solid and well modulated, so hope to hear more of you when you are not so busy with your other interests, Bert.

EASTERN ZONE

It has been a very quiet month for the Eastern Zone. The Fox Hunt was held on 8th June at Yarram instead of the last Sunday in May. Jack 3AJK has been operating portable up and down the New South Wales coast. Cliff 3AIT is now also active on 2 mxx as well as the h.f. bands.

SOUTH WESTERN ZONE

Well chaps I am sorry to say there does not seem to be very much news this month as I have not heard much on the hook-ups although they seem to be very well patronised. I think the only thing of importance is our congratulations to the 3ATL Geelong Radio Club on their fine effort at the Exhibition held recently in Geelong. Glad to hear that 3AWZ has at last broken his long silence by coming on the hook-up after about a month or so's hard work with those students.

MOORABBIN AND DISTRICT RADIO CLUB

At the May meeting of the Club, a talk was given by the Secretary, Laurie 3CN, on "Radioactive Isotopes, what and why?" The speaker dealt with the history of the atomic

theory, the discovery of isotopes and the use of radio-active isotopes in industry and research.

The Club is approaching a temporary crisis in its affairs, as the small building we have used since foundation is to be demolished in the near future, to allow for extension of the Council Chambers. It is not yet known for certain when this deloruous event will take place, and we do not know how we will fare for accommodation in the future. One of our members has kindly offered the use of his garage as a temporary measure to tide us over until permanent arrangements can be made. Members will be notified in the monthly circular when any change of location occurs. Meanwhile, we shall carry on until the building collapse around our ears.

Congratulations to our President, Stan 3ZE, on the recent happy occasion of the wedding of his daughter. Let's hope to hear some sub-harmonic radiations from 3ZE some time in the future!

GEELOGONG AMATEUR RADIO CLUB

Activity is very prominent in our area again and we have attended many interesting functions. Ted 3AEH opened his shack for inspection and we were privileged to see in operation all the home constructed gear. The highlight of the evening was a t.v. 17 inch receiver and cabinet made by Ted himself. It reproduced a perfect image of professional quality.

As well Bill 3AWZ entertained a good crowd at his shack to watch v.h.f. gear in action. Several stations were contacted. Some 27 bodies sat down to supper to conclude an interesting evening.

The members of the Club maintained a four-day stall at the Y.M.C.A. Exhibition in a 1-7-acre show site. Most bands were worked. 3ALP and helpers operated on 80, 40, 30 mxx, whilst 3ZAV maintained skeds on 2 mxx. The enquiries and interest of sightseers was beyond expectations. The President, Jim 3ABT, is to be congratulated for the amount of time he put into the effort.

The gear exhibited was of a high standard. It was well labelled and there were many working pieces of apparatus. Some of these were, grid dip osc., ocelliscopes, receivers (both fixed and mobile), audio osc. Vic Clarke entered his exhibit to show d.f. equipment and radio controlled boats were shown by Laurie

CHANGE OF ADDRESS

W.I.A. members are requested to promptly notify any change of address to their Divisional Secretary, not direct to "Amateur Radio."

Costor. The result of this Exhibition has meant the addition of 12 new members and the regular class in A.O.C.P. will commence again soon.

Recently Arch 3BW worked 14 Japanese stations on 6 mxx and has been all smiles since. Congrats, Arch.

The local Cancer Appeal was quickly helped by our members. Four mobile cars assisted the local b.c. station in receiving money from suburbs of Geelong. It was good practice for mobile gear and once more showed how Amateur gear can work under a variety of conditions. Those assisting were 3AFK, 3XHL, 3AWZ, and 3BU operated tirelessly as base station. The cars raised £200 collectively.

QUEENSLAND

The Council meeting held on 8th May was fully attended with John 4FP in the chair. Minutes of the previous meeting were read and confirmed. It was noted that there have been a number of inquiries concerning correspondence courses for the A.O.C.P. and these have been referred to Stan 4SA, the Divisional Class Manager.

Jim 4OB presented the Treasurer's report for the past month and present indications reveal the possibility of a record year financially. Jim said that for the beginning of the new financial year, 1961, the city and 18 country Hams on his books, and over 100 further subscriptions were expected. Remember, by now if you haven't paid your subscription, your copies of "A.R." and "QTC" will be discontinued.

Jim also stated that it was imperative to assess the complete value of the Institute's assets and a meeting of the trustees should be convened as soon as possible.

Arthur, as Federal Councillor, reported having received a motion submitted by VKZ in support of the publishing of the Call Book with asterisks denoting financial members of the Wireless Institute in Australia. The matter was fully investigated and Fred 4ZAF moved the motion that we whole heartedly support this idea. Bruce 4ZBD seconded the motion. Approval or any alteration to the published list of call signs must have the consent of the Postmaster General's Department. Arthur also presented correspondence from Max Huil, the Federal President, concerning a list of recommendations in the organisation of the I.T.U. campaign. Council felt that the need for support, not only from Institute members, but Hams generally, could not be stressed enough. An earnest evaluation of the hobby of Amateur Radio will show just how important the request for financial support really is! Please send your donations immediately!

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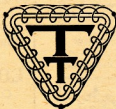
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Jack 47F has a list of non-members who have cards at the Bureau. The list will be published in "QTC" so, as further information is disclosed, members asked to be added to the list. The non-member can secure his card by joining the Institute and availing himself of all the facilities by sending adequate return postage to the Bureau.

As new members join the Institute, their names and call signs will henceforth be published.

Council sent the reminder that Hama with mobile gear, going to Palm Beach for the next two days, will be in the vicinity of the Radio Branch of the P.M.C. Incidentally, the Convention is to be insured against rain. Jim 40B gave notice of a motion. He requests that (1) Students be reduced under the age of 18 be given a reduction in the annual subscription; (2) An amount of money be set aside in the fund to be used at the discretion of the instructors, the most improved student in the W.I.A. class.

Before the meeting closed, Jim reminded councillors to request members not to send stamps in payment for anything, nor to add exchange to cheques. A high rate of exchange is levied on the latter.

The general meeting was held at State Service rooms and a good roll-up heard a very interesting tape about life on Macquarie Island. The Secretary read out the minutes of the R.S.S.A.I.A. for our support in supplying a radio display at the Lota-Manly Hobbies Exhibition. Students were asked to help. Amateurs were asked to keep this in mind.

Bruce 4ZBD, as Chairman of the Convention Committee, gave a report on the progress of which have been published in "QTC". The Convention generally has received considerable advertisement in "QTC", over 4W1 and fully featured in the local press. He said that anyone who pleads guilty to not knowing about the Convention is really out of touch with civilisation.

The President called upon Bert 4AO to pass a vote of thanks to the retiring President, Frank 4ZM. Bert very ably thanked Frank for the work he had done and for the part he played in his continued interest in furthering the aims of Amateur Radio. Bill 4XO seconded Bert's thanks. Frank, in his reply, said that he was sorry to vacate the chair, but he had, during his term of office, made many friends and he wished every success to the President. He wished the Convention to go on and the Institute to greater heights. The members showed their appreciation of Frank's work by a good round of applause.

Bruce 4ZBD inquired if any reply had been received from Federal Executive concerning the retention of the 50 Mc. band at the convention. The I.C.T. to date has not been received. Inquiries were also made concerning the rejuvenation of the Contest Committee. It was decided that a new contest will be formed at the Palm Beach Convention. Hard on the heels of this request, Bert 4AO submitted that all contests with rules and conditions be published one year in A.R. This motion was amended by Alan 4ZAE to the effect that a selected list of contests be initially published, giving regard to local contests and conditions. However, both the motion and the amendment were defeated when put to the vote. The President then announced that the Qld. Division gives an award for working the same station over 100 times.

The social activities of the Institute are being carried on by the 1000 member of film shows and lectures has been drawn up. They are of wide variety and interest and should be of great value to the members at general meeting attendances. The next general meeting will be held at the M.L.C. Building at 7.30 p.m., fourth Friday of the month, when an interesting film of considerable duration will be shown.

4W1 can now be heard on Sunday mornings from 12.00 to 1.00 p.m. The program is broadcast through Bert on 7146 Kc., Frank 1432 Kc. and Bruce 50172 Kc. after news broadcasts. The last 2 mhz Tx Hunt was conducted on the 1st of May when the 4W1 did the tx on the southern side of the Brisbane River, near Caversham road dock. Ross 4ZAT located the 4W1 and the 4W1 was heard on 4FF. The roll-up was rather disappointing as only four mobiles completed. However, the support provided by 4W1 at the location was up to the high standard which everyone appreciated the nice hot cups of tea.

TOWNSVILLE

My sincere thanks to Radio Amateurs everywhere for their kind messages of sympathy in the sad loss of my wife who passed away suddenly on May 1st.

Apologies to Stan 4SA in leaving you out of call signs in flood emergency, and hope you managed to get out of the red tape entanglement. The last time I heard of you was on a tape, recording from the old northern maestro

4BW, who is an inmate of the South Brisbane Auxiliary Hospital to undergo an operation tomorrow, Monday.

Good luck Andy. This recurrent illness is also the result of the largest net of 14 Mc. for quite a long time. It goes to show that quite a large number of listeners do not participate in the round-table discussions. Andy appeared on the air first and soon got into his stride and finished up passing his 73 to all the northern boys; he then went on to the sky the way that is out of date and located at Bundaberg.

Callers on the net came from as far away as the U.S.A., played on the 14 Mc. band in Island and even New Zealand. Call in again boys, it is sure good to hear you all.

Jim 4DO came in on the net last week, gave a sign report and then played on the 14 Mc. Norm NNT reports working down as far as Inverell (VK2 land) on 50 Mc. and asks VK4 Hany other to look for him 7-9 a.m. each Sunday morning.

Bob 4TK sent along the following doings on 7 Mc., his favorite band: The morning 7 Mc. hook-up has not been the same since Andy 4BW was forced to leave due to ill health. He is now an inmate in the hospital in Brisbane. He has been very keen about the hospital, but he does not play up. Bob 4TK is carrying out duties of M.C. pending Andy's return. We all wish him a speedy recovery.

Bruce 4ZW was a good spokesman in getting the Cairns and district Hama and S.W.I. together at a meeting and explaining the possibility of a delegate from the W.I.A. going to the Geneva Convention. He also mentioned funds, too; many coming across with one db, for this purpose. Several subscribers were not heard of, but they should be the byed-in. The wool Ham to follow suit and fight to protect his hobby. Good luck Basil.

Harry 4A has had a visit from his brother, but he has not stopped his early morning joining in the hook-up. He is only four QSOs short of 1000 with 4BW and was unable to make time for the morning hook-up. Don 4PW not heard in the morning but from time to time on the afternoon session. Took a tape recording of a couple of his contacts on a recent evening and gave the tape a play back.

John 4DK busy as a serviceman, overhauling and modifying gear used elsewhere in the district. John asks for advice and then tells how it would be done. Alex 4MA not heard a lot but promises to come on regularly if he has time. Claude 4UX not heard from since he arrived in Townsville en route for home to earn a few chips to pay for the broken piano. His car is still broken. Vern 4LK still getting settled down in the new QTH is a regular listener to JA land on 10 Mc. He has a goldfish. Good! Just finished a spot of batching and votes Mum's cooking is better.

SOUTH AUSTRALIA

There are several ways to get to know this world of ours; one is to travel around and see it; another to work plenty of DX and hear about it; and a third way is to witness travel movies of scenes taken by a more fortunate traveller.

That is exactly what we did at our last meeting when Shep. 5DC gave us a full presentation of his film trip to the U.S.A., ZL to U.S.A. and Canada and return. Some excellent photography and most interesting commentary provided enjoyable evening to a full house of membership with many visitors.

QSL distribution and formal business nearly took a back seat, but in spite of the late hour they were dealt with, the two main items being a vote again placed in the bag against W.I.A. Members Calls in the new Call Book figured that would have too many problems in the way of an up-date and the other was to be further remind all of the need to be mindful of the obligation to assist by donation, the fund to finance I.T.U. delegate.

There have been some enquiries regarding the address and phone number of our new Secretary, John 1432 Kc. & Co. home being 1 Ormonde Avenue, Cheltenham, with phone M 7681.

Leo 5WV (last June) we in VKs were treated to a fairly successful attempt at jamming the session by two carriers of great strength (unmodulated) setting on and wabbling the session. Success! The 14 Mc. band of loops that have come out of hiding, so if nothing else it will be interesting work to d.f. the session.

President Brian 5CA undertook the session for the four weeks Gordon was tied up on the music seat, and reminds all who listen, that if the music is not to the taste, give a report, but have no modulator, to use c.w.

All the noise we have been talking about for months seems to have taken a holiday for on the last few Sundays every 7 meg. signal has been in the lap of the sky. The temporary mood resulting from more signal than noise. Quite a treat after the poor conditions prevailing up to the rain, so it is not only primary progress but also the sky the signal days.

Of course chaps like Tubby 5NO and Bob 5RI don't know what we mean by this and for the time being, we will pull the signal days. That fact 8E 5AX has a plate of mushrooms or a cold 807 ready for anyone who can locate the gremlin who annoys him, or for anyone who can locate the gremlin who annoys him. A mess of noise that no limiter seems to quieten down for him.

John 5BX has joined in the Northern Net again, welcome fellow. Bob 5RI always obliges with a good signal and takes part in "tests" like one recently when Norm 5AP again lined up his a.s.b. rig. Very good and very many db's up on the a.m. signal and really has some talk power.

The new rig from 5WC, which is that of 5FY, is doing a good job now. All bugs seem to be removed and as far as the signal is concerned, it is the latest as good as ever came from that QTH in spite of the temporary and no rhombic. The shack up there is in course of removal to the new site and much blood, sweat and tears have been shed. A very recent contact with that gang sounded like what a QSO would sound like from an M.C.C. Great news! The following for a few Irish types to be cricketers.

Fred 5MA pops up more regularly these days and a newcomer to the band is Col 6XY, he did it more often chaps, we like hearing from you boys. Doc 5AC has been very active recently, forsaking his beloved 21 megs. Just long enough to do that. Ask him some time how one could member support and should raise some capital for a project he was contemplating.

David 5AW, using a Geloso to parallel 807s with a "harmonic" type filter on feeders, has managed to kill all harmonics, some of which bothered him on 20 at first, so there is one way to do it. Other he couldn't call it. Described in "A.R.", and also Ham Tips.

Doug 5DW now has some more power and Jim 5E in the fray more often, whilst 4K 5SS has added a new chair to the lounge but two lounge chairs for no other reason than to provide comfort for visitors.

Bert 4AO is back in the game, probably going by now, for a.s.b. First class gear too, so we presume he will be after DXCC on a.s.b. now, just bring back the monotony.

There seems quite a influx of new comers, as these days as more get bitten, listening on 20, 15 and 10 mhz. Quite a number are to be heard on the 10 mhz. Yoo! Just finished a spot of batching and votes Mum's cooking is better.

Laurie 5XN has really been going to town on DX. DX lately and he is using the DE of his G4UZ only, he has managed to work the following on 16: 2D4, 2D2, VF8, HK, KH, W, G, YSL, V52, VPD, VZP, VF8, VQ8 and 25. He has also worked other he couldn't call it.

Judging by some of the DX heard calling VKs it is apparent this State has had its share of DX. Other he couldn't call it.

Dave 5BF heard on both 80 and 40 mhz (not at once, Dave, different times) with very good sign. Not much from WA 5DF these days, he has added a new chair to the lounge but two lounge chairs for no other reason than to provide comfort for visitors.

In good spirits, or was when he (Keith) was in Port Lincoln recently.

Recently the mountains, Chas 5ON, heard on recently with a whole of a signal. You haven't shifted lately Chas? The 5WV is still in the game, including Wick 5WM, Tom 5TL, Ken 5KC, Les 5AX, with an attempt whilst Les to work John 5KX whilst on the move but didn't make it.

Alan 5SW continued to add to his list of overseas friends, for every time any DX is worked from this QTH the inevitable remark of the station so worked is "you are a good one" and he gives a report, him many times.

Some day hope to work someone who doesn't know Austin and Phil. The 5WV is still in the game, including Wick 5WM, Tom 5TL, Ken 5KC, Les 5AX, with an attempt whilst Les to work John 5KX whilst on the move but didn't make it.

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Spare time will come again Tom. So keep the rig dusted in the meantime.

We conclude on a sad note this month, elsewhere in this issue you will read of the sudden death of VK6 member, known W.A. members, Doug Whitburn, 8BY. His cheerful disposition, untiring efforts for the Division generally, and his ready acceptance of executive posts in the Institute over many years, combined with his continual active DX work, made him perhaps our most popular member. Our sympathy goes to his sorrowing widow and those who share her bereavement.

WESTERN AUSTRALIA

The May meeting of this Division was fairly well attended. The highlight of the night was a lecture by Mr. D. McLernon on "Ultrasonic Machining". Mr. McLernon brought and illustrated an ultrasonic machine used for drilling square (or any other odd shaped) holes in glass. For those unable to attend who may be interested, the machine consisted of an audio sig. gen. feeding an audio tone (about 36 kc. in this case) into an audio amp—EL34s in class AB, about 68 watts output, being obtained. This audio power was fed to a transducer, the "drill" being a brass rod which expands and contracts in sympathy with the audio tone, cutting and grinding away over the surface of the glass does the actual cutting. Tolerance is in the order of 0.0004 inch. The demonstration was particularly interesting because the equipment was developed and built in W.A. by Mr. McLernon.

The Council has met the representatives of W.A. Short, to complete the final arrangements re admitting the Group to the W.I.A. as a member club. It is hoped that everything will be done and numbers issued by the time this is printed.

Another matter being dealt with which should be finalised by the time these notes are printed is the conferring of life membership on VK6WVS. This gentleman has been an active member of this Division for more years than most of us can remember. He has remained an active Amateur for 25 years, when at the age of 86, he was forced to give it up due to blindness. We send Skipper our congratulations on his life membership, and our very best wishes for the future.

At the last meeting a letter was read from the Advisory Committee asking that Amateurs in this Division be required to ensure that they observe Regs. 91, 130 and 133, as some breaches had been noted. If you don't know what these Regs mean, advise you to look them up in your handbook.

Wally GAG has been appointed to handle the new feature "The Other Man's Station." This appears in this magazine. Any club members who wish to be included please send photos and details to Wally.

During a recent visit to VK6, Doc SMD is believed to have asked how GRU managed to maintain such active participation by VK6 in the R.D. Contest. If only you knew, Doc! It is believed that Jim is passing around the buffalo-hide whips and rolling out the big guns ready for this year's effort. The larger number of stations in this State should ensure that year should ensure an even better effort than last year.

Six players have received a shot in the arm from DX which has been worked over the last six months. There are now over 20 stations active on this band in VK6. Among them are 6B, 6C, 6D, 6E, 6F, 6G, 6H, 6I, 6J, 6K, 6L, 6M, 6N, 6O, 6P, 6Q, 6R, 6S, 6T, 6U, 6V, 6W, 6X, 6Y, 6Z, 6AA, 6AB, 6AC, 6AD, 6AE, 6AF, 6AG, 6AH, 6AI, 6AJ, 6AK, 6AL, 6AM, 6AN, 6AO, 6AP, 6AQ, 6AR, 6AS, 6AT, 6AU, 6AV, 6AW, 6AX, 6AY, 6AZ, 6BA, 6BB, 6BC, 6BD, 6BE, 6BF, 6BG, 6BH, 6BI, 6BJ, 6BK, 6BL, 6BM, 6BN, 6BO, 6BP, 6BQ, 6BR, 6BS, 6BT, 6BU, 6BV, 6BW, 6BX, 6BY, 6BZ, 6CA, 6CB, 6CC, 6CD, 6CE, 6CF, 6CG, 6CH, 6CI, 6CJ, 6CK, 6CL, 6CM, 6CN, 6CO, 6CP, 6CQ, 6CR, 6CS, 6CT, 6CU, 6CV, 6CW, 6CX, 6CY, 6CZ, 6DA, 6DB, 6DC, 6DD, 6DE, 6DF, 6DG, 6DH, 6DI, 6DJ, 6DK, 6DL, 6DM, 6DN, 6DO, 6DP, 6DQ, 6DR, 6DS, 6DT, 6DU, 6DV, 6DW, 6DX, 6DY, 6DZ, 6EA, 6EB, 6EC, 6ED, 6EE, 6EF, 6EG, 6EH, 6EI, 6EJ, 6EK, 6EL, 6EM, 6EN, 6EO, 6EP, 6EQ, 6ER, 6ES, 6ET, 6EU, 6EV, 6EW, 6EX, 6EY, 6EZ, 6FA, 6FB, 6FC, 6FD, 6FE, 6FF, 6FG, 6FH, 6FI, 6FJ, 6FK, 6FL, 6FM, 6FN, 6FO, 6FP, 6FQ, 6FR, 6FS, 6FT, 6FU, 6FV, 6FW, 6FX, 6FY, 6FZ, 6GA, 6GB, 6GC, 6GD, 6GE, 6GF, 6GG, 6GH, 6GI, 6GJ, 6GK, 6GL, 6GM, 6GN, 6GO, 6GP, 6GQ, 6GR, 6GS, 6GT, 6GU, 6GV, 6GW, 6GX, 6GY, 6GZ, 6HA, 6HB, 6HC, 6HD, 6HE, 6HF, 6HG, 6HH, 6HI, 6HJ, 6HK, 6HL, 6HM, 6HN, 6HO, 6HP, 6HQ, 6HR, 6HS, 6HT, 6HU, 6HV, 6HW, 6HX, 6HY, 6HZ, 6IA, 6IB, 6IC, 6ID, 6IE, 6IF, 6IG, 6IH, 6II, 6IJ, 6IK, 6IL, 6IM, 6IN, 6IO, 6IP, 6IQ, 6IR, 6IS, 6IT, 6IU, 6IV, 6IW, 6IX, 6IY, 6IZ, 6JA, 6JB, 6JC, 6JD, 6JE, 6JF, 6JG, 6JH, 6JI, 6JJ, 6JK, 6JL, 6JM, 6JN, 6JO, 6JP, 6JQ, 6JR, 6JS, 6JT, 6JU, 6JV, 6JW, 6JX, 6JY, 6JZ, 6KA, 6KB, 6KC, 6KD, 6KE, 6KF, 6KG, 6KH, 6KI, 6KJ, 6KL, 6KM, 6KN, 6KO, 6KP, 6KQ, 6KR, 6KS, 6KT, 6KU, 6KV, 6KW, 6KX, 6KY, 6KZ, 6LA, 6LB, 6LC, 6LD, 6LE, 6LF, 6LG, 6LH, 6LI, 6LJ, 6LK, 6LL, 6LM, 6LN, 6LO, 6LP, 6LQ, 6LR, 6LS, 6LT, 6LU, 6LV, 6LW, 6LX, 6LY, 6LZ, 6MA, 6MB, 6MC, 6MD, 6ME, 6MF, 6MG, 6MH, 6MI, 6MJ, 6MK, 6ML, 6MN, 6MO, 6MP, 6MQ, 6MR, 6MS, 6MT, 6MU, 6MV, 6MW, 6MX, 6MY, 6MZ, 6NA, 6NB, 6NC, 6ND, 6NE, 6NF, 6NG, 6NH, 6NI, 6NJ, 6NK, 6NL, 6NM, 6NN, 6NO, 6NP, 6NQ, 6NR, 6NS, 6NT, 6NU, 6NV, 6NW, 6NX, 6NY, 6NZ, 6OA, 6OB, 6OC, 6OD, 6OE, 6OF, 6OG, 6OH, 6OI, 6OJ, 6OK, 6OL, 6OM, 6ON, 6OO, 6OP, 6OQ, 6OR, 6OS, 6OT, 6OU, 6OV, 6OW, 6OX, 6OY, 6OZ, 6PA, 6PB, 6PC, 6PD, 6PE, 6PF, 6PG, 6PH, 6PI, 6PJ, 6PK, 6PL, 6PM, 6PN, 6PO, 6PP, 6PQ, 6PR, 6PS, 6PT, 6PU, 6PV, 6PW, 6PX, 6PY, 6PZ, 6QA, 6QB, 6QC, 6QD, 6QE, 6QF, 6QG, 6QH, 6QI, 6QJ, 6QK, 6QL, 6QM, 6QN, 6QO, 6QP, 6QQ, 6QR, 6QS, 6QT, 6QU, 6QV, 6QW, 6QX, 6QY, 6QZ, 6RA, 6RB, 6RC, 6RD, 6RE, 6RF, 6RG, 6RH, 6RI, 6RJ, 6RK, 6RL, 6RM, 6RN, 6RO, 6RP, 6RQ, 6RR, 6RS, 6RT, 6RU, 6RV, 6RW, 6RX, 6RY, 6RZ, 6SA, 6SB, 6SC, 6SD, 6SE, 6SF, 6SG, 6SH, 6SI, 6SJ, 6SK, 6SL, 6SM, 6SN, 6SO, 6SP, 6SQ, 6SR, 6SS, 6ST, 6SU, 6SV, 6SW, 6SX, 6SY, 6SZ, 6TA, 6TB, 6TC, 6TD, 6TE, 6TF, 6TG, 6TH, 6TI, 6TJ, 6TK, 6TL, 6TM, 6TN, 6TO, 6TP, 6TQ, 6TR, 6TS, 6TT, 6TU, 6TV, 6TW, 6TX, 6TY, 6TZ, 6UA, 6UB, 6UC, 6UD, 6UE, 6UF, 6UG, 6UH, 6UI, 6UJ, 6UK, 6UL, 6UM, 6UN, 6UO, 6UP, 6UQ, 6UR, 6US, 6UT, 6UU, 6UV, 6UW, 6UX, 6UY, 6UZ, 6VA, 6VB, 6VC, 6VD, 6VE, 6VF, 6VG, 6VH, 6VI, 6VJ, 6VK, 6VL, 6VM, 6VN, 6VO, 6VP, 6VQ, 6VR, 6VS, 6VT, 6VU, 6VV, 6VW, 6VX, 6VY, 6VZ, 6WA, 6WB, 6WC, 6WD, 6WE, 6WF, 6WG, 6WH, 6WI, 6WJ, 6WK, 6WL, 6WM, 6WN, 6WO, 6WP, 6WQ, 6WR, 6WS, 6WT, 6WU, 6WV, 6WW, 6WX, 6WY, 6WZ, 6XA, 6XB, 6XC, 6XD, 6XE, 6XF, 6XG, 6XH, 6XI, 6XJ, 6XK, 6XL, 6XM, 6XN, 6XO, 6XP, 6XQ, 6XR, 6XS, 6XT, 6XU, 6XV, 6XW, 6XX, 6XY, 6XZ, 6YA, 6YB, 6YC, 6YD, 6YE, 6YF, 6YG, 6YH, 6YI, 6YJ, 6YK, 6YL, 6YM, 6YN, 6YO, 6YP, 6YQ, 6YR, 6YS, 6YT, 6YU, 6YV, 6YW, 6YX, 6YY, 6YZ, 6ZA, 6ZB, 6ZC, 6ZD, 6ZE, 6ZF, 6ZG, 6ZH, 6ZI, 6ZJ, 6ZK, 6ZL, 6ZM, 6ZN, 6ZO, 6ZP, 6ZQ, 6ZR, 6ZS, 6ZT, 6ZU, 6ZV, 6ZW, 6ZX, 6ZY, 6ZZ, 7AA, 7AB, 7AC, 7AD, 7AE, 7AF, 7AG, 7AH, 7AI, 7AJ, 7AK, 7AL, 7AM, 7AN, 7AO, 7AP, 7AQ, 7AR, 7AS, 7AT, 7AU, 7AV, 7AW, 7AX, 7AY, 7AZ, 7BA, 7BB, 7BC, 7BD, 7BE, 7BF, 7BG, 7BH, 7BI, 7BJ, 7BK, 7BL, 7BM, 7BN, 7BO, 7BP, 7BQ, 7BR, 7BS, 7BT, 7BU, 7BV, 7BW, 7BX, 7BY, 7BZ, 7CA, 7CB, 7CC, 7CD, 7CE, 7CF, 7CG, 7CH, 7CI, 7CJ, 7CK, 7CL, 7CM, 7CN, 7CO, 7CP, 7CQ, 7CR, 7CS, 7CT, 7CU, 7CV, 7CW, 7CX, 7CY, 7CZ, 7DA, 7DB, 7DC, 7DD, 7DE, 7DF, 7DG, 7DH, 7DI, 7DJ, 7DK, 7DL, 7DM, 7DN, 7DO, 7DP, 7DQ, 7DR, 7DS, 7DT, 7DU, 7DV, 7DW, 7DX, 7DY, 7DZ, 7EA, 7EB, 7EC, 7ED, 7EE, 7EF, 7EG, 7EH, 7EI, 7EJ, 7EK, 7EL, 7EM, 7EN, 7EO, 7EP, 7EQ, 7ER, 7ES, 7ET, 7EU, 7EV, 7EW, 7EX, 7EY, 7EZ, 7FA, 7FB, 7FC, 7FD, 7FE, 7FF, 7FG, 7FH, 7FI, 7FJ, 7FK, 7FL, 7FM, 7FN, 7FO, 7FP, 7FQ, 7FR, 7FS, 7FT, 7FU, 7FV, 7FW, 7FX, 7FY, 7FZ, 7GA, 7GB, 7GC, 7GD, 7GE, 7GF, 7GG, 7GH, 7GI, 7GJ, 7GK, 7GL, 7GM, 7GN, 7GO, 7GP, 7GQ, 7GR, 7GS, 7GT, 7GU, 7GV, 7GW, 7GX, 7GY, 7GZ, 7HA, 7HB, 7HC, 7HD, 7HE, 7HF, 7HG, 7HH, 7HI, 7HJ, 7HK, 7HL, 7HM, 7HN, 7HO, 7HP, 7HQ, 7HR, 7HS, 7HT, 7HU, 7HV, 7HW, 7HX, 7HY, 7HZ, 7IA, 7IB, 7IC, 7ID, 7IE, 7IF, 7IG, 7IH, 7II, 7IJ, 7IK, 7IL, 7IM, 7IN, 7IO, 7IP, 7IQ, 7IR, 7IS, 7IT, 7IU, 7IV, 7IW, 7IX, 7IY, 7IZ, 7JA, 7JB, 7JC, 7JD, 7JE, 7JF, 7JG, 7JH, 7JI, 7JJ, 7JK, 7JL, 7JM, 7JN, 7JO, 7JP, 7JQ, 7JR, 7JS, 7JT, 7JU, 7JV, 7JW, 7JX, 7JY, 7JZ, 7KA, 7KB, 7KC, 7KD, 7KE, 7KF, 7KG, 7KH, 7KI, 7KJ, 7KL, 7KM, 7KN, 7KO, 7KP, 7KQ, 7KR, 7KS, 7KT, 7KU, 7KV, 7KW, 7KX, 7KY, 7KZ, 7LA, 7LB, 7LC, 7LD, 7LE, 7LF, 7LG, 7LH, 7LI, 7LJ, 7LK, 7LM, 7LN, 7LO, 7LP, 7LQ, 7LR, 7LS, 7LT, 7LU, 7LV, 7LW, 7LX, 7LY, 7LZ, 7MA, 7MB, 7MC, 7MD, 7ME, 7MF, 7MG, 7MH, 7MI, 7MJ, 7MK, 7ML, 7MN, 7MO, 7MP, 7MQ, 7MR, 7MS, 7MT, 7MU, 7MV, 7MW, 7MX, 7MY, 7MZ, 7NA, 7NB, 7NC, 7ND, 7NE, 7NF, 7NG, 7NH, 7NI, 7NJ, 7NK, 7NL, 7NM, 7NN, 7NO, 7NP, 7NQ, 7NR, 7NS, 7NT, 7NU, 7NV, 7NW, 7NX, 7NY, 7NZ, 7OA, 7OB, 7OC, 7OD, 7OE, 7OF, 7OG, 7OH, 7OI, 7OJ, 7OK, 7OL, 7OM, 7ON, 7OO, 7OP, 7OQ, 7OR, 7OS, 7OT, 7OU, 7OV, 7OW, 7OX, 7OY, 7OZ, 7PA, 7PB, 7PC, 7PD, 7PE, 7PF, 7PG, 7PH, 7PI, 7PJ, 7PK, 7PL, 7PM, 7PN, 7PO, 7PP, 7PQ, 7PR, 7PS, 7PT, 7PU, 7PV, 7PW, 7PX, 7PY, 7PZ, 7QA, 7QB, 7QC, 7QD, 7QE, 7QF, 7QG, 7QH, 7QI, 7QJ, 7QK, 7QL, 7QM, 7QN, 7QO, 7QP, 7QQ, 7QR, 7QS, 7QT, 7QU, 7QV, 7QW, 7QX, 7QY, 7QZ, 7RA, 7RB, 7RC, 7RD, 7RE, 7RF, 7RG, 7RH, 7RI, 7RJ, 7RK, 7RL, 7RM, 7RN, 7RO, 7RP, 7RQ, 7RR, 7RS, 7RT, 7RU, 7RV, 7RW, 7RX, 7RY, 7RZ, 7SA, 7SB, 7SC, 7SD, 7SE, 7SF, 7SG, 7SH, 7SI, 7SJ, 7SK, 7SL, 7SM, 7SN, 7SO, 7SP, 7SQ, 7SR, 7SS, 7ST, 7SU, 7SV, 7SW, 7SX, 7SY, 7SZ, 7TA, 7TB, 7TC, 7TD, 7TE, 7TF, 7TG, 7TH, 7TI, 7TJ, 7TK, 7TL, 7TM, 7TN, 7TO, 7TP, 7TQ, 7TR, 7TS, 7TT, 7TU, 7TV, 7TW, 7TX, 7TY, 7TZ, 7UA, 7UB, 7UC, 7UD, 7UE, 7UF, 7UG, 7UH, 7UI, 7UJ, 7UK, 7UL, 7UM, 7UN, 7UO, 7UP, 7UQ, 7UR, 7US, 7UT, 7UU, 7UV, 7UW, 7UX, 7UY, 7UZ, 7VA, 7VB, 7VC, 7VD, 7VE, 7VF, 7VG, 7VH, 7VI, 7VJ, 7VK, 7VL, 7VM, 7VN, 7VO, 7VP, 7VQ, 7VR, 7VS, 7VT, 7VU, 7VV, 7VW, 7VX, 7VY, 7VZ, 7WA, 7WB, 7WC, 7WD, 7WE, 7WF, 7WG, 7WH, 7WI, 7WJ, 7WK, 7WL, 7WM, 7WN, 7WO, 7WP, 7WQ, 7WR, 7WS, 7WT, 7WU, 7WV, 7WW, 7WX, 7WY, 7WZ, 7XA, 7XB, 7XC, 7XD, 7XE, 7XF, 7XG, 7XH, 7XI, 7XJ, 7XK, 7XL, 7XM, 7XN, 7XO, 7XP, 7XQ, 7XR, 7XS, 7XT, 7XU, 7XV, 7XW, 7XX, 7XY, 7XZ, 7YA, 7YB, 7YC, 7YD, 7YE, 7YF, 7YG, 7YH, 7YI, 7YJ, 7YK, 7YL, 7YM, 7YN, 7YO, 7YP, 7YQ, 7YR, 7YS, 7YT, 7YU, 7YV, 7YW, 7YX, 7YY, 7YZ, 7ZA, 7ZB, 7ZC, 7ZD, 7ZE, 7ZF, 7ZG, 7ZH, 7ZI, 7ZJ, 7ZK, 7ZL, 7ZM, 7ZN, 7ZO, 7ZP, 7ZQ, 7ZR, 7ZS, 7ZT, 7ZU, 7ZV, 7ZW, 7ZX, 7ZY, 7ZZ, 8AA, 8AB, 8AC, 8AD, 8AE, 8AF, 8AG, 8AH, 8AI, 8AJ, 8AK, 8AL, 8AM, 8AN, 8AO, 8AP, 8AQ, 8AR, 8AS, 8AT, 8AU, 8AV, 8AW, 8AX, 8AY, 8AZ, 8BA, 8BB, 8BC, 8BD, 8BE, 8BF, 8BG, 8BH, 8BI, 8BJ, 8BK, 8BL, 8BM, 8BN, 8BO, 8BP, 8BQ, 8BR, 8BS, 8BT, 8BU, 8BV, 8BW, 8BX, 8BY, 8BZ, 8CA, 8CB, 8CC, 8CD, 8CE, 8CF, 8CG, 8CH, 8CI, 8CJ, 8CK, 8CL, 8CM, 8CN, 8CO, 8CP, 8CQ, 8CR, 8CS, 8CT, 8CU, 8CV, 8CW, 8CX, 8CY, 8CZ, 8DA, 8DB, 8DC, 8DD, 8DE, 8DF, 8DG, 8DH, 8DI, 8DJ, 8DK, 8DL, 8DM, 8DN, 8DO, 8DP, 8DQ, 8DR, 8DS, 8DT, 8DU, 8DV, 8DW, 8DX, 8DY, 8DZ, 8EA, 8EB, 8EC, 8ED, 8EE, 8EF, 8EG, 8EH, 8EI, 8EJ, 8EK, 8EL, 8EM, 8EN, 8EO, 8EP, 8EQ, 8ER, 8ES, 8ET, 8EU, 8EV, 8EW, 8EX, 8EY, 8EZ, 8FA, 8FB, 8FC, 8FD, 8FE, 8FF, 8FG, 8FH, 8FI, 8FJ, 8FK, 8FL, 8FM, 8FN, 8FO, 8FP, 8FQ, 8FR, 8FS, 8FT, 8FU, 8FV, 8FW, 8FX, 8FY, 8FZ, 8GA, 8GB, 8GC, 8GD, 8GE, 8GF, 8GG, 8GH, 8GI, 8GJ, 8GK, 8GL, 8GM, 8GN, 8GO, 8GP, 8GQ, 8GR, 8GS, 8GT, 8GU, 8GV, 8GW, 8GX, 8GY, 8GZ, 8HA, 8HB, 8HC, 8HD, 8HE, 8HF, 8HG, 8HH, 8HI, 8HJ, 8HK, 8HL, 8HM, 8HN, 8HO, 8HP, 8HQ, 8HR, 8HS, 8HT, 8HU, 8HV, 8HW, 8HX, 8HY, 8HZ, 8IA, 8IB, 8IC, 8ID, 8IE, 8IF, 8IG, 8IH, 8II, 8IJ, 8IK, 8IL, 8IM, 8IN, 8IO, 8IP, 8IQ, 8IR, 8IS, 8IT, 8IU, 8IV, 8IW, 8IX, 8IY, 8IZ, 8JA, 8JB, 8JC, 8JD, 8JE, 8JF, 8JG, 8JH, 8JI, 8JJ, 8JK, 8JL, 8JM, 8JN, 8JO, 8JP, 8JQ, 8JR, 8JS, 8JT, 8JU, 8JV, 8JW, 8JX, 8JY, 8JZ, 8KA, 8KB, 8KC, 8KD, 8KE, 8KF, 8KG, 8KH, 8KI, 8KJ, 8KL, 8KM, 8KN, 8KO, 8KP, 8KQ, 8KR, 8KS, 8KT, 8KU, 8KV, 8KW, 8KX, 8KY, 8KZ, 8LA, 8LB, 8LC, 8LD, 8LE, 8LF, 8LG, 8LH, 8LI, 8LJ, 8LK, 8LM, 8LN, 8LO, 8LP, 8LQ, 8LR, 8LS, 8LT, 8LU, 8LV, 8LW, 8LX, 8LY, 8LZ, 8MA, 8MB, 8MC, 8MD, 8ME, 8MF, 8MG, 8MH, 8MI, 8MJ, 8MK, 8ML, 8MN, 8MO, 8MP, 8MQ, 8MR, 8MS, 8MT, 8MU, 8MV, 8MW, 8MX, 8MY, 8MZ, 8NA, 8NB, 8NC, 8ND, 8NE, 8NF, 8NG, 8NH, 8NI, 8NJ, 8NK, 8NL, 8NM, 8NN, 8NO, 8NP, 8NQ, 8NR, 8NS, 8NT, 8NU, 8NV, 8NW, 8NX, 8NY, 8NZ, 8OA, 8OB, 8OC, 8OD, 8OE, 8OF, 8OG, 8OH, 8OI, 8OJ, 8OK, 8OL, 8OM, 8ON, 8OO, 8OP, 8OQ, 8OR, 8OS, 8OT, 8OU, 8OV, 8OW, 8OX, 8OY, 8OZ, 8PA, 8PB, 8PC, 8PD, 8PE, 8PF, 8PG, 8PH, 8PI, 8PJ, 8PK, 8PL, 8PM, 8PN, 8PO, 8PP, 8PQ, 8PR, 8PS, 8PT, 8PU, 8PV, 8PW, 8PX, 8PY, 8PZ, 8QA, 8QB, 8QC, 8QD, 8QE, 8QF, 8QG, 8QH, 8QI, 8QJ, 8QK, 8QL, 8QM, 8QN, 8QO, 8QP, 8QQ, 8QR, 8QS, 8QT, 8QU, 8QV, 8QW, 8QX, 8QY, 8QZ, 8RA, 8RB, 8RC, 8RD, 8RE, 8RF, 8RG, 8RH, 8RI, 8RJ, 8RK, 8RL, 8RM, 8RN, 8RO, 8RP, 8RQ, 8RR, 8RS, 8RT, 8RU, 8RV, 8RW, 8RX, 8RY, 8RZ, 8SA, 8SB, 8SC, 8SD, 8SE, 8SF, 8SG, 8SH, 8SI, 8SJ, 8SK, 8SL, 8SM, 8SN, 8SO, 8SP, 8SQ, 8SR, 8SS, 8ST, 8SU, 8SV, 8SW, 8SX, 8SY, 8SZ, 8TA, 8TB, 8TC, 8TD, 8TE, 8TF, 8TG, 8TH, 8TI, 8TJ, 8TK, 8TL, 8TM, 8TN, 8TO, 8TP, 8TQ, 8TR, 8TS, 8TT, 8TU, 8TV, 8TW, 8TX, 8TY, 8TZ, 8UA, 8UB, 8UC, 8UD, 8UE, 8UF, 8UG, 8UH, 8UI, 8UJ, 8UK, 8UL, 8UM, 8UN, 8UO, 8UP, 8UQ, 8UR, 8US, 8UT, 8UU, 8UV, 8UW, 8UX, 8UY, 8UZ, 8VA, 8VB, 8VC, 8VD, 8VE, 8VF, 8VG, 8VH, 8VI, 8VJ, 8VK, 8VL, 8VM, 8VN, 8VO, 8VP, 8VQ, 8VR, 8VS, 8VT, 8VU, 8VV, 8VW, 8VX, 8VY, 8VZ, 8WA, 8WB, 8WC, 8WD, 8WE, 8WF, 8WG, 8WH, 8WI, 8WJ, 8WK, 8WL, 8WM, 8WN, 8WO, 8WP, 8WQ, 8WR, 8WS, 8WT, 8WU, 8WV, 8WW, 8WX, 8WY, 8WZ, 8XA, 8XB, 8XC, 8XD, 8XE, 8XF, 8XG, 8XH, 8XI, 8XJ, 8XK, 8XL, 8XM, 8XN, 8XO, 8XP, 8XQ, 8XR, 8XS, 8XT, 8XU, 8XV, 8XW, 8XX, 8XY, 8XZ, 8YA, 8YB, 8YC, 8YD, 8YE, 8YF, 8YG, 8YH, 8YI, 8YJ, 8YK, 8YL, 8YM, 8YN, 8YO, 8YP, 8YQ, 8YR, 8YS, 8YT, 8YU, 8YV, 8YW, 8YX, 8YY, 8YZ, 8ZA, 8ZB, 8ZC, 8ZD, 8ZE, 8ZF, 8ZG, 8ZH, 8ZI, 8ZJ, 8ZK, 8ZL, 8ZM, 8ZN, 8ZO, 8ZP, 8ZQ, 8ZR, 8ZS, 8ZT, 8ZU, 8ZV, 8ZW, 8ZX, 8ZY, 8ZZ, 9AA, 9AB, 9AC, 9AD, 9AE, 9AF, 9AG, 9AH, 9AI, 9AJ, 9AK, 9AL, 9AM, 9AN, 9AO, 9AP, 9AQ, 9AR, 9AS, 9AT, 9AU, 9AV, 9AW, 9AX, 9AY, 9AZ, 9BA, 9BB, 9BC, 9BD, 9BE, 9BF, 9BG, 9BH, 9BI, 9BJ, 9BK, 9BL, 9BM, 9BN, 9BO, 9BP, 9BQ, 9BR, 9BS, 9BT, 9BU, 9BV, 9BW, 9BX, 9BY, 9BZ, 9CA, 9CB, 9CC, 9CD, 9CE, 9CF, 9CG, 9CH, 9CI, 9CJ, 9CK, 9CL, 9CM, 9CN, 9CO, 9CP, 9CQ, 9CR, 9CS, 9CT, 9CU, 9CV, 9CW, 9CX, 9CY, 9CZ, 9DA, 9DB, 9DC, 9DD, 9DE, 9DF, 9DG, 9DH, 9DI, 9DJ, 9DK, 9DL, 9DM, 9DN, 9DO, 9DP, 9DQ, 9DR, 9DS, 9DT, 9DU, 9DV, 9DW, 9DX, 9DY, 9DZ, 9EA, 9EB, 9EC, 9ED, 9EE, 9EF, 9EG, 9EH, 9EI, 9EJ, 9EK, 9EL, 9EM, 9EN, 9EO, 9EP, 9EQ, 9ER, 9ES, 9ET, 9EU, 9EV, 9EW, 9EX, 9EY, 9EZ, 9FA, 9FB, 9FC, 9FD, 9FE, 9FF, 9FG, 9FH, 9FI, 9FJ, 9FK, 9FL, 9FM, 9FN, 9FO, 9FP, 9FQ, 9FR, 9FS, 9FT, 9FU, 9FV, 9FW, 9FX, 9FY, 9FZ, 9GA, 9GB, 9GC, 9GD, 9GE, 9GF, 9GG, 9GH, 9GI, 9GJ, 9GK, 9GL, 9GM, 9GN, 9GO, 9GP, 9GQ, 9GR, 9GS, 9GT, 9GU, 9GV, 9GW, 9GX, 9GY, 9GZ, 9HA, 9HB, 9HC, 9HD, 9HE, 9HF, 9HG, 9HH, 9HI, 9HJ, 9HK, 9HL, 9HM, 9HN, 9HO, 9HP, 9HQ, 9HR, 9HS, 9HT, 9HU, 9HV, 9HW, 9HX, 9HY, 9HZ, 9IA, 9IB, 9IC, 9ID, 9IE, 9IF, 9IG, 9IH, 9II, 9IJ, 9IK, 9IL, 9IM, 9IN, 9IO, 9IP, 9IQ, 9IR, 9IS, 9IT, 9IU, 9IV, 9IW, 9IX, 9IY, 9IZ, 9JA, 9JB, 9JC, 9JD, 9JE, 9JF, 9JG, 9JH, 9JI, 9JJ, 9JK, 9JL, 9JM, 9JN, 9JO, 9JP, 9JQ, 9JR, 9JS, 9JT, 9JU, 9JV, 9JW, 9JX, 9JY, 9JZ, 9KA, 9KB, 9KC, 9KD, 9KE, 9KF, 9KG, 9KH, 9KI, 9KJ, 9KL, 9KM, 9KN, 9KO, 9KP, 9KQ, 9KR, 9KS, 9KT, 9KU, 9KV, 9KW, 9KX, 9KY, 9KZ, 9LA, 9LB, 9LC, 9LD, 9LE, 9LF, 9LG, 9LH, 9LI, 9LJ, 9LK, 9LM, 9LN, 9LO, 9LP, 9LQ, 9LR, 9LS, 9LT, 9LU, 9LV, 9LW, 9LX, 9LY, 9LZ, 9MA, 9MB, 9MC, 9MD, 9ME, 9MF, 9MG, 9MH, 9MI, 9MJ, 9MK, 9ML, 9MN, 9MO, 9MP, 9MQ, 9MR, 9MS, 9MT, 9MU, 9MV, 9MW, 9MX, 9MY, 9MZ, 9NA, 9NB, 9NC, 9ND, 9NE, 9NF, 9NG, 9NH, 9NI, 9NJ, 9NK, 9NL, 9NM, 9NN, 9NO, 9NP, 9NQ, 9NR, 9NS, 9NT, 9NU, 9NV, 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9VO, 9VP, 9VQ, 9VR, 9VS, 9VT, 9VU, 9VV, 9VW, 9VX, 9VY, 9VZ, 9WA, 9WB, 9WC, 9WD, 9WE, 9WF, 9WG, 9WH, 9WI, 9WJ, 9WK, 9WL, 9WM, 9WN, 9WO, 9WP, 9WQ, 9WR, 9WS, 9WT, 9WU, 9WV, 9WW, 9WX, 9WY, 9WZ, 9XA, 9XB, 9XC, 9XD, 9XE, 9XF, 9XG, 9XH, 9XI, 9XJ, 9XK, 9XL, 9XM, 9XN, 9XO, 9XP, 9XQ, 9XR, 9XS, 9XT, 9XU, 9XV, 9XW, 9XX, 9XY, 9XZ, 9YA, 9YB, 9YC, 9YD, 9YE, 9YF, 9YG, 9YH, 9YI, 9YJ, 9YK, 9YL, 9YM, 9YN, 9YO, 9YP, 9YQ, 9YR, 9YS, 9YT, 9YU, 9YV, 9YW, 9YX, 9YY, 9YZ, 9ZA, 9ZB, 9ZC, 9ZD, 9ZE, 9ZF, 9ZG, 9ZH, 9ZI, 9ZJ, 9ZK, 9ZL, 9ZM, 9ZN, 9ZO, 9ZP, 9ZQ, 9ZR, 9ZS, 9ZT, 9ZU, 9ZV, 9ZW, 9ZX, 9ZY, 9ZZ, 0AA, 0AB, 0AC, 0AD, 0AE, 0

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